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Mongolia's Arctic Connections:

The Hovsgol Deer Stone Project, 2001-2002 Field Report

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Cover photograph: G. Tsetsegmaa and relatives at Tsaatan camp on Minge Polog river summer camp, 2001.

Introduction

William W. Fitzhugh[1]

This report presents the results of anthropological and environmental reconnaissance conducted in 2001 and 2002 by the Arctic Studies Center in Hovsgol Aimag, northern Mongolia. The project began as part of a humanitarian venture to aid the Tsaatan[2] (Dukha) reindeer herders living in the West Darkhat Valley, organized by Edward Nef, director of Inlingua Languages Services School of Arlington, Virginia, with his Mongolian subsidiary, Santis Foundation, in Ulaanbaatar. Nef had traveled previously to Hovsgol, where he had been impressed by the region's deer stone sites and other archaeological monuments. He had also met the Tsaatan reindeer herders living in the eastern Sayan mountains west of Lake Hovsgol, learning of their struggle to maintain their herds in the face of climatic warming and changes in lichen pasture ecology, and of political, economic, and social changes brought about by Mongolia's release from Soviet domination. Hoping that scientific studies could assist the Tsaatan, Nef invited Steven Young (an arctic botanist and paleoecologist) and me (an arctic archaeologist and anthropologist) to accompany his 2001 expedition. In addition to exploring the region's environment and archaeology, we planned to explore Mongolia's cultural and biological connections to northern Asia and the circumpolar region, a topic that heretofore has received no attention by natural scientists or anthropologists.

The 2001 expedition from 25 June to 6 July provided orientation and introduced us to the Hovsgol environment and archaeology, and its Mongol and Tsaatan residents. The subsequent 2002 season organized in order to prepare a foundation for future archaeological, ethnographic, botanical, and paleoenvironmental research. This report described these projects and the research questions that brought us to Mongolia in the first place, in four parts. Part I presents the broader rationale for studying Mongolia's relationship to the circumpolar world. Part II describes research themes we are exploring in northern Mongolia, where deer stone monuments and Bronze and Iron Age mortuary structures are a dominant feature of the cultural landscape. Part III is a preliminary report by Stephen Young on the region's paleoecologyPart IV is a narrative sketch of the 2001-2 field activities; Part V is a preliminary report on Tsaatan reindeer ecology; and Part VI reports briefly on archaeological sites and finds, illustrates maps, photographs, and field sketches, and presents radiocarbon dates and preliminary conclusions. The Appendices provide a selection of photographs, radiocarbon dates, and GPS coordinates of sites and field stations.

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[2] Tsaatan, meaning 'reindeer herder' in Mongolian, is the customary term used by Mongolians to refer to the people known more anthropologically as Dukha, the name they used before their recent political isolation from other South Siberian Tuva-speaking peoples, who continue to live in Russia.

PART I

Mongolia and the Circumpolar World

The Search for Asian Contacts and Eskimo Origins

A principal goal of the Deer Stone Project is to explore Mongolia's cultural, historical, and environmental relationships to northern Eurasia and the North Pacific. Therefore, at the outset it may be helpful to explain why Mongolia – a sparsely-populated, nation of 2.5 million people located nearly 2000 km south of the Arctic Circle – might have some bearing on arctic issues like reindeer breeding, the diffusion of metal and other technologies, and the spread of peoples, ideas, and art around the world. In particular, as in the case of the peopling of the New World, the development of early Eskimo cultures in the Bering Sea seems to have been influenced by Asian metal, shamanistic concepts, and new artistic traditions. Perhaps most significant was one element of Eurasian arctic culture that did not enter Alaska: reindeer breeding. Although the spread of this technology resulted in a profound transformation of almost all of Eurasian arctic hunters into herders and pastoralists, North American arctic and subarctic peoples across Bering Strait remained isolated from this powerful agent of change. Mongolia may have had a role in these innovations and transmissions.

Figure 1.1 Ushkin Uver deer stone complex

For more than 100 years archaeologists have searched without success for the roots of Eskimo culture in arctic regions, in the Bering Sea, and along the coast of northeast Asia from Japan to Chukotka. Although physical similarities between Eskimos and Mongolians seemed to imply historical connections, Mongolia's remoteness and different cultures discouraged investigation of a possible role in North Pacific history. Today, with Mongolia accessible to Westerners for the first time in 80 years, it has become possible to explore such questions as: did Mongolia play a role as a center of population dispersal into Northeast Asia? was it involved in the development of reindeer domestication? and could its early cultures have been sources or transmitters of cultural information from Central Asia into the North Pacific region? As part of my interest in these questions (Fitzhugh 2002a), I would like to briefly describe why we are exploring these issues from a Mongolian perspective.

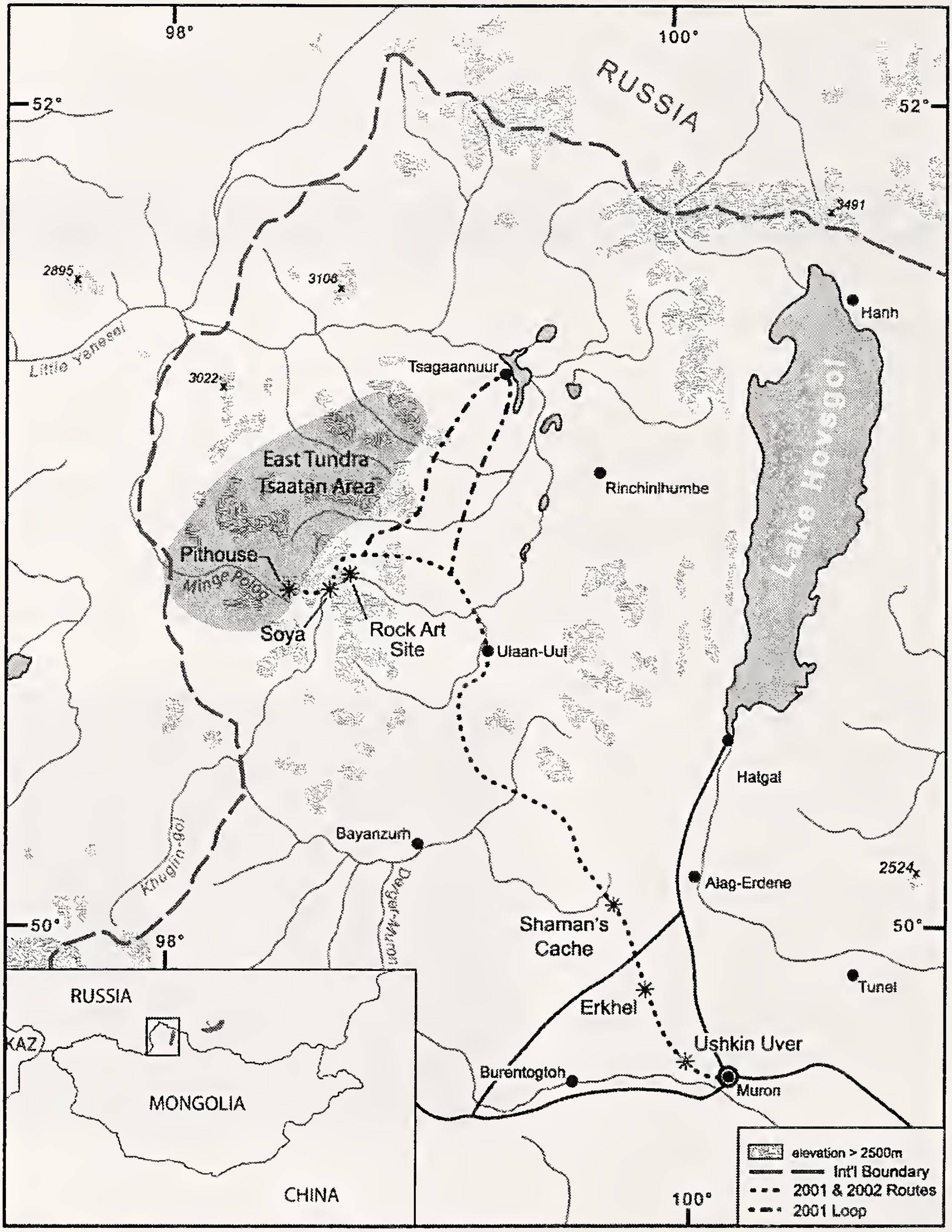

Figure 1.2 Sites and routes of the 2001 and 2002 expeditions

Bering Strait, Alaska

Since the 1930s, archaeologists investigating early Alaskan Eskimo cultures have suspected that key elements of this complex – including metallurgy, shamanism, art, and religion concepts – originated in Asia (Jenness 1928, 1940; Collins 1937, 1951, 1972; Schuster 1951). Study of the engraved art of the Old Bering Sea II/III and Punuk cultures (A.D. 400-1000) show that these carvings were made with iron-tipped engraving tools of Asian origin. While the origins of the art styles and motifs have not yet been traced reliably outside the Bering Sea region (Collins 1972; Bronshtein and Plumet 1995; Arutiunov 2003), some artifacts found in OBS burials, such as ivory chains and ivory open-work carvings resembling bronze castings, clearly have Siberian prototypes (Arutiunov and Sergeev 1975; Arutiunov and Fitzhugh 1988). Asian contacts, however, are most dramatically seen at the Ipiutak site at Point Hope, Alaska, where Larsen and Rainey (1948) found composite ivory death masks and huge numbers of elaborate bone and ivory open-work carvings that mimic Siberian metal rattles and shamanic costume ornaments. The excavators attributed such exotic forms to the introduction of a Siberian shamanistic complex into Alaska and linked specific artifact styles to the Permian Bronze and Iron Age of West Siberia (Larsen and Rainey 1948; Rainey 1971). Later, Henry Collins and Hans-Georg Bandi proposed that Ipiutak composite bone masks and other elements of the Ipiutak complex might be have been inspired by composite jade masks and other artifacts in the Chou period in Eastern China (Collins 1971; Bandi 1974). Carl Schuster (1951) had similar ideas and linked early Eskimo art to Scytho-Siberian animal-style art of Central Asia, but without identifying specific archaeological intermediaries.

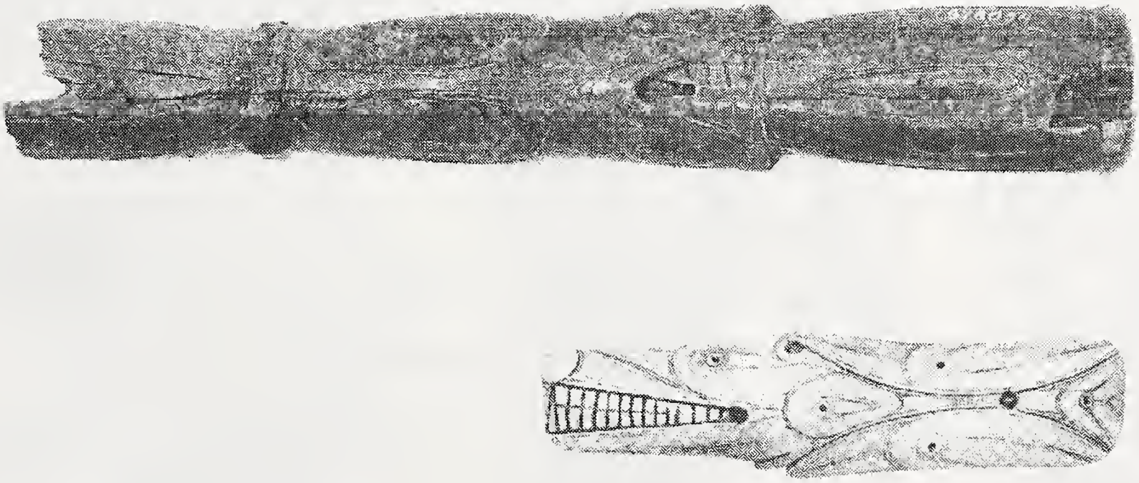

Figure 1.3 *Old Bering Sea harpoon socket piece and hat ornament (lower) illustrating a hunter's helping spirits. (Smithsonian Institution Collections)*

Despite such tantalizing clues, progress in exploring the Asian connections of Alaskan Eskimo prehistory was slow to materialize. For much of the 20th century, Western scientists had little access to Soviet scientists, publications, and archaeological sites, especially in the Soviet Far East and Chukotka. However, during the 1970s, scientific exchanges made it possible for arctic specialists from the U.S. and Russia to meet, and in the 1980s the Smithsonian's *Crossroads of Continents* exhibition (Fitzhugh and Crowell 1988) and a subsequent post-glasnost 'mini-Crossroads' exhibit provided Soviet and North American scholars with a chance to begin serious studies of trans-Beringian research.

An "Eskimo-like" Culture in Yamal

By 1990 it became possible for Russian and Western scientists to collaborate freely and share fieldwork opportunities. Interested in exploring the little-known Eurasian circumpolar corridor, I began working with Russian colleagues on Neolithic, Bronze, and Iron Age sites in Yamal and on the lower Ob River in Western Siberia. I had previously concluded that convergent development rather than trans-Atlantic contact was responsible for similarities between Scandinavia Younger Stone Age cultures and 4000-year old Indian cultures of Northeastern North America, and that neither had contributed to Eskimo origins (Fitzhugh 1974, 1975). But Chernetsov's tentative conclusion that an early 'Eskimo-like' culture existed during the Iron age on the Kara Sea coast of Yamal (Chernetsov 1935; Chernetsov 1974; Moshinskaya 1974) – the same find that prompted Larsen and Rainey to propose West Siberian connections at Ipiutak – remained unconfirmed. Their claim in 1948 was plausible if Eskimo culture originated, as one early theory claimed, when European Paleolithic peoples followed the retreating glacial ice and reindeer north into the Arctic. Although this idea was discredited when Henry Collins demonstrated a 2000-year history of Eskimo development in the Bering Sea, the earliest cultures of Collins' sequence – Okvik and Old Bering Sea cultures – were already fully 'Eskimo' in nature, with no known ancestors in this region. Given the lack of knowledge of the huge expanse of the Russian Arctic, it was impossible to deny north Eurasian origins. Birnirk and Punuk-like Eskimo sites were known as far west as the Kolyma River and the Bear Islands (Collins 1940; Jenness 1940; Chard 1958; Ackerman 1984), but 3500 km of Arctic Ocean coast between here and Yamal was still mostly unexplored.

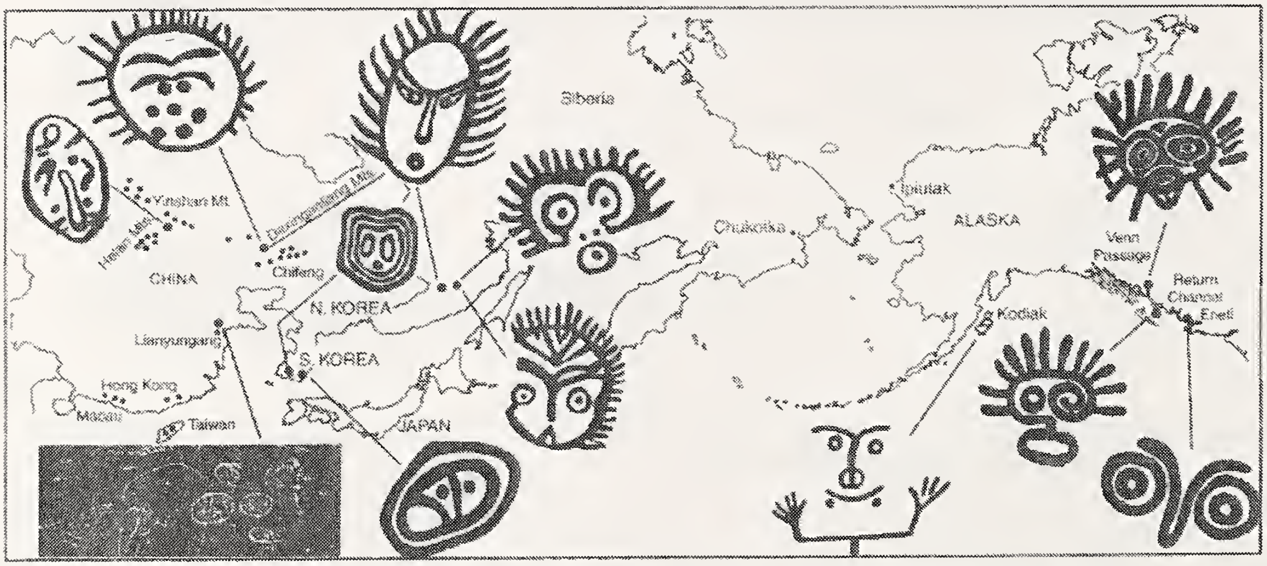

Figure 1.4 *Map of North Pacific with human-face petroglyphs. (Y. Song, ASC Newsletter Suppl. 1998)*

Nevertheless, three years of fieldwork with Russian archaeologists familiar with this area convinced me that Chernetsov's early 'arctic maritime culture' of Yamal was neither maritime nor 'Eskimo' (Fitzhugh 1997). Similar conclusions were beginning to be reached in Taimyr (Pitulko 1999c), along the Laptev Sea and West Chukchi Sea, and at an 8000-year old Mesolithic site on Zhokhov Island (Pitulko 1999a), all of which produced no proto-'Eskimo' evidence (Fitzhugh 2002a).

Primor'e to Bering Strait: Ritual Art, and Transformation

While explorations of the Russian arctic coast continued, new research between Bering Strait and Vladivostok, long considered a potential area of influence related to Eskimo origins (Chard 1958), advanced knowledge of this little-known region and identified Asian prototypes for some archaeological complexes and elements known from Alaska (Dumond and Bland 1995), including the likely origins of 4000 B.P. Denbigh Complex and Arctic Small Tool tradition ceramics and lithics in Siberian Neolithic cultures (Irving 1962; Powers and Jordan 1990). During these years, work on Old Koryak (Vasil'evskii 1971; Dikov 1979), Ymyiakhtakh (Fedoseeva 1980), Tokarev and Tar'insk (Lebedintsev 1990), and Lakhtina (Orekhov 1999) cultures expanded the inventory of early Northwest Pacific maritime cultures. But to date none have revealed prototypes for Old Bering Sea art and religion; nor has such information emerged from studies further south around the mouth of the Amur, in Sakhalin, northern Japan, or Korea, although 6000 year old harpoon forms have been found in Jomon Japan (Yamaura 1978). Also of interest are developments in rock art research which expand knowledge of human face art and early Asian masking traditions dating to ca. 4000-1000 B.P. in the Lower Amur and northern China (Okladnikov 1981; Song 1992). These images indicate a long tradition of body decoration and labret use such as that found among Old Bering Sea and later Beringian cultures and suggest a possible medium for links between Eastern Asia and the Bering Sea that is usually not preserved in archaeological complexes. Another possible connection may be seen in ground slate technology, which appears in Old Bering Sea, Northeast Asian and Korean cultures about 2000 years ago, shortly after the appearance of metal technology in Central Asia and eastern Siberia. It seems likely that slate grinding may have been begun as a metal substitute among peoples who knew of this technology from their contacts to the south but did not practice it themselves, as was true in the case of Old Bering Sea ivory chains and East Siberian and Far Eastern ceramic copies of bronze vessels.

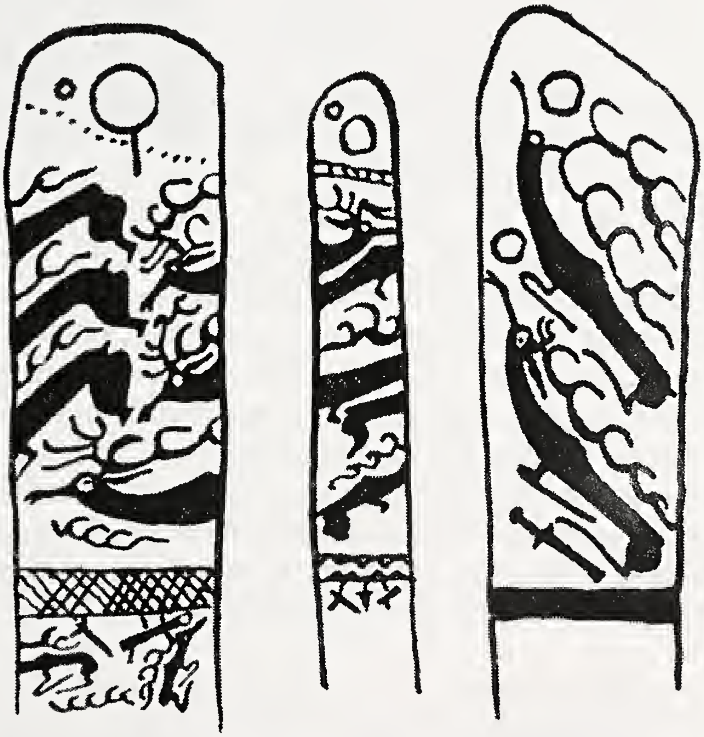

Figure 1.5 *Deer stone iconography showing the 'flying' deer, and anthropomorhphic features such as 'ear rings,' belts and tools*

The fine decoration of ethnographic clothing from such groups as the Ainu, Nanai, Nivkhi, and other Lower Amur River peoples may be a legacy of the highly ornate Asian tradition of body decoration. These artistic ethnographic and prehistoric traditions of the northeast Asian maritime region may in turn be related to the decorative arts of Central Asia as seen especially in the Scythian tombs of the Altai. Mongolia's deer stone monuments, representing an early form of animal-style art applied to a monumental human form, first attracted my attention because they are found in the Central Asian steppe which forms a natural path of communication linking Central Asia with the North Pacific coast; because they date to Bronze and Early Iron Age period when Eskimo cultures must have been in its formative stages; and because they appear to embody religious, spiritual, and artistic concepts similar to those that underlie ancient and modern Bering Sea ethnographic art, but that are so far missing from intermediate periods and regions of northerneastern Siberia (Fitzhugh 1988, 1993).

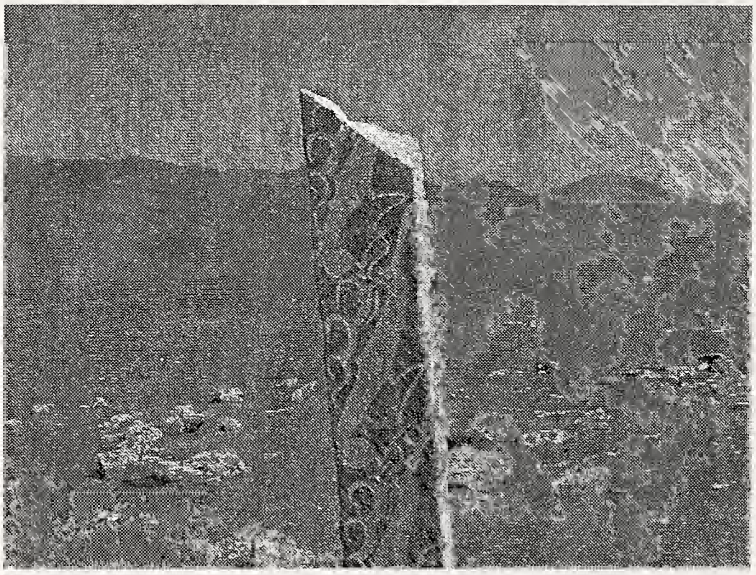

Figure 1.6 Ushkin Uver deer stone with lightning damage

At this time I do not propose a specific solution to the chain of Asian influence that may have contributed to Eskimo culture, but only suggest a mechanism as to how powerful symbolic elements of Asian culture may have infiltrated the indigenous cultures of Northeast Asia and Alaska. The specific artistic forms – whether they be Scythian, proto-Scythian, early Korean, Jomon, or others – need detailed investigation with new archaeological evidence; but equally important are studies of the cultural contexts – as death ritual, hunting magic, representations of deities and animal spirits, shamanism, etc. – in which they occur. What strikes me as most interesting in comparing deer stone and early Eskimo art is the use of transformation images. In the case of deer stones, this involves combining images (bills) of water birds (special spirit-helpers of North Asian shamans) with the Asian elk – the most magnificent and powerful cervid of Eurasia. Similarly, Alaskan Eskimo have for hundreds of years have depicted wolf-killer whale, seal-water bird, and *tao-tieh*-like human-beast transformation figures, representing beings or spirits that changed physical forms while crossing barriers between land and water, water and air, or land and air. Lacking proto-Eskimo elements among early Northwest Coast cultures, and with a predominance of Asian over North American influences in the culture history of the Bering Sea, it seems appropriate to search central Eastern Asia (Mongolia) for the sources that may have contributed to distinctive elements of Eskimo culture during the past 4000 years.

Clearly we have a long way to go in terms of understanding the meaning of the deer stone images in Sibero-Mongolian contexts, where Esther Jacobson and her Russian colleagues have already advanced knowledge to a considerable extent (Jacobson 1993, 2002). Establishing connections, if any, to the cultures of the North Pacific region will certainly be an even greater challenge, given the process of cultural translation involved across the many cultural boundaries in between. The relation of the deer stone image to North Pacific systems of knowledge is one of several topics needing study. When viewed from the perspective of arctic cultures, and especially regarding the art and religious beliefs of the peoples of the North Pacific rim, I am struck not so much by similarities in artistic form or style as by the similar concepts that appear to lie behind the deer stone motif: the representation of a spirit-helper or transformational being that linked earth and sky and served as a device to ensure an honored leader's safer passage into the upper world, much as designs on clothing and tattoos and body charms protected the living and the dead from spiritual dangers throughout much of eastern Asia and the Pacific world for thousands of years. Another more specific issue is Eskimo relationships to symbolic and representational art within Late Bronze/Early Iron Age cultures of Central and East Asia. And a third is the search among intervening cultures of Northeast Asia for identical and similar forms. To date, that search has been surprisingly unproductive in the recovery of comparable art.

Hovsgol and the Mongolian Arctic Connection

Investigation of deer stone art and its associated archaeological and landscape ritual features were not the only reasons to begin research in Mongolia. Other topics include (1) the origins and history of Mongolian reindeer herding; (2) the culture history of northern Mongolia and in particular the development of its steppe and mountain peoples; (3) the ecology of Tsaatan reindeer husbandry and potential threats from global warming and changing environments; and (4) the broader question of Mongolia's cultural and historical relationships to peoples of Siberia and Northeast Asia. While considerable attention has been given to Mongolia's Paleolithic past by Russian and American teams (Olson 2000); Bronze Age regional social structure (Honeychurch n.d.); the development of 'nomadic' empires and the silk route trade (Rogers 2002; Rogers et al. n.d.); and relationships with China (Lattimore 1940), relatively little research has been conducted on Mongolia's connections to Siberia and its role in population dispersal and culture contacts into the circumpolar region and maritime northeast Asia. Mongolia's northern connections also need to studied from the perspective of paleo-climate, vegetation, and landscape change. Some of these factors are discussed in Steven Young's field report (Part III of this report) which explores the interesting (and historically/culturally important) possibility of ancient paleoenvironmental continuities between Beringia and the North Pacific. These subjects are explored more fully in the following section.

PART II

Deer Stone Project Research Themes

Continuing more sharply upon research to be conducted in the Hovsgol-Darkhat region, we turn now to specific Deer Stone Project research themes, plans, and progress toward these goals. Results of archaeological research conducted to date are not included here as they are discussed in Part VI.

(1) The Tsaatan (Dukha) – South Siberian Reindeer Herders

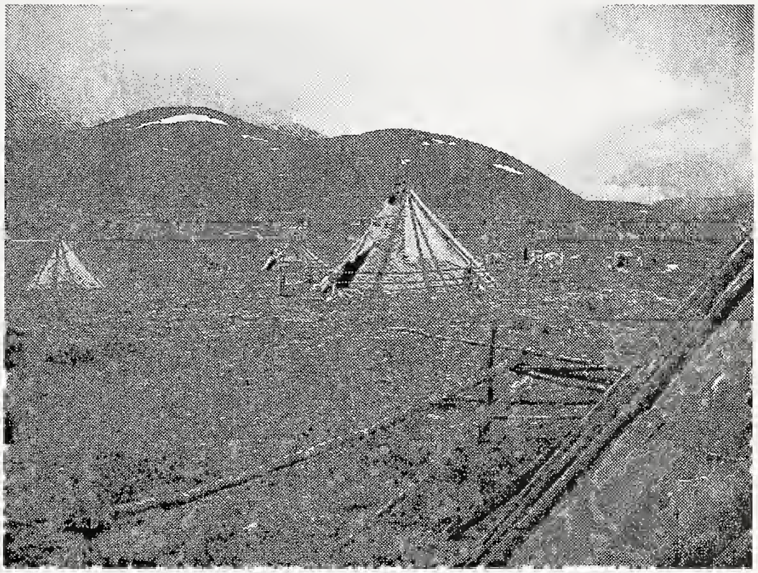

Figure 2.1 *Minge Polog 'West Tundra' Tsaatan summer camp*

An ethno-ecology focus on the Tsaatan (Dukha) "Reindeer People," is at the core of the Deer Stone Project (Fitzhugh et al. 2002b). Numbering about 700 people and 1000 reindeer, the Tsaatan are the southernmost reindeer-herders in the world (Vainstein 1980; Cultural Survival 2003). Of the four Tuva-speaking groups between Lakes Baikal and Hovsgol, only the Tsaatan – the southernmost of this group and the only one living in Mongolia – still depend largely on reindeer herding (Wheeler 1999; Plumley and Battulag 1999; Donahoe 2003; Solnoi et al. 2003). The 5000-7000 foot high forest and tundra pastures west of the Darkhat Valley, lying within a few miles of the Russian Tuva border, provide lichen forage for reindeer at the extreme southern limit of their range in Asia. This reindeer range is at the same time a territorial outlier of the main reindeer species distribution owing to a special geographic condition that has created a pocket of lichen-rich "Siberian" habitat in the East Sayan mountains. To the north of Hovsgol, elevations drop, causing reindeer habitat to become even more marginal in the thick, warmer larch forests. Today, the Tsaatan's Tuva-speaking relatives in Russia have largely given up reindeer herding, largely due to socioeconomic changes, and the Tsaatan are experiencing many of the same forces: climatic warming which is causing tundra range reduction and reduced reindeer fitness; out-migration of herders to villages and cities; and difficulties related to post-Soviet political, economic, and social change.

Our work relating to the Tsaatan is not intended as a detailed ethnographic, historical, or sociological study. Rather, it complements on-going ethnographic studies in the Darkhat region (Wheeler 1999l, 2000) and humanitarian projects such as the Totem Project (Plumley 2001) and Santis Education Projects. Our goals include documenting Tsaatan ecological knowledge, herding practices, and ritual life relating to reindeer husbandry (including shamanism) in order to better understand the challenges facing Tsaatan reindeer-herding in the future.

(2) Mongolia's Taiga Interface

One of the project's goals is to counteract the anti-Mongolian bias that has resulted from historical accounts created during the past 500 years by Chinese and Soviet archaeologists and historians (Lattimore 1940, 1962; Ewing 1980; Sandorj 1980; Ishjamts 1994). Following the period of the Mongol Empire when its neighbors were often brutally subjugated by Mongolian forces, China and later the Soviet Union followed similar policies, viewing Mongolia as a political and geographical buffer and a source of natural resources, suppressing Mongolian nationalism and identity. During these periods research on Mongolian history and archaeology was dominated by Chinese or Soviet perspectives that tended to deny Mongolia had a unique past of its own especially before Genghis Khan and the Mongol Empire, and saw its earlier history as extensions of Chinese or Siberian culture history. Such views ignore the fact that the Mongolia steppe was probably one of the most productive grazing environments in Eurasia. This Central Asian 'Serengeti' supported not only the immediate needs of local hunting and herding societies; it also provided protein, hides, fur, antler and horn for trade to taiga and temperate peoples to the north and south. While the extent of regional trade during early periods is not yet known, the large numbers of archaeological sites from the Paleolithic to modern times suggests that the Mongolian steppe has always been ecologically productive and culturally vital. Given its geographical centrality within East Asia and the ease of communication across the open steppe, Mongolia is likely to have been an important economic and cultural crossroads for thousands of years, as in historic times (Bawden 1989; Christian 1998; Baabar 1999; Barfield 2001; DiCosmo 2002).

Compared to the greater attention given to studies of Chinese influence on and contacts with Mongolia, and to studies of the Empire period, there has been less exploration of Mongolia's eastern and northern connections. During the Soviet period, northern Mongolia's early cultures were viewed largely as extensions of cultures known from the Siberian taiga. While significant ecological, subsistence, and cultural differences exist between cultures of the steppe and taiga, to suppose that this border was static or impenetrable flies in the face of most anthropological research of borders and boundaries. Research along the Mongolian steppe-taiga frontier may reveal this border to have been as active a zone of cultural development and dispersal across the steppe-taiga boundary as the fabled east-west Silk Road. Whereas it is likely that economic and social change and the introduction of new technologies like early animal domestication, metallurgy, ceramics, textiles and fine decorative arts may have been transmitted first along the great open grasslands, north-south contacts would have distributed new ideas and materials to taiga and arctic peoples, whose cultures may have made their own contributions to Central Asian societies in such areas as shamanism, art, ivory, furs and other goods. Exploration of Mongolia's environmental and cultural connections with southern Siberia, Northeast Asia, and the North Pacific during the past 6000 years are of special interest in this regard.

(3) Pingos, Paleoenvironments and Climate Change

Mongolia's harsh winter climate qualifies it as an 'arctic' region, a point driven home by our discovery in 2001 of cone-shaped permafrost features known as pingos in several areas south and west of Lake Hovsgol. We noted that their ice core centers, which can take decades if not hundreds of years to form, were in the last stage of collapse from abnormal recent climatic warming, a phenomena that has also been documented in Mongolian tree ring studies (Jacoby et al. 1996). It is almost certain that considerable environmental change has occurred during the Holocene. Of special importance is the history of the steppe-taiga border zone, which may have shifted considerably during the past 10,000 years due to changes in precipitation, temperature, and human-induced impacts of animal domestication and grazing, forest clearance, fire, wood-cutting, and other activities.

An intriguing idea emerging from our 2001 season was Steven Young's observation that Mongolia's tundra and alpine plant communities were quite similar to the ancient vegetation of the Beringian Land Bridge, suggesting the possibility of phytogeographic connections with the arctic (Young n.d.). We plan to explore these connections by working with scientists involved in reconstructing Mongolia's vegetation history, and by comparing the DNA of specific plant species. We will also investigate local and regional environmental change in the vicinity of our archaeological sites. Our 2002 discovery of a 6000 B.P. buried forest and peat deposits at Soyö will provide information on the paleoenvironment of this Neolithic archaeological site. In 2003, geologists from the University of Pittsburgh working with our project will conduct geological studies of lake sediments from the West Darkhat region which should provide a record of climatic history for the post-glacial period for use in our environmental and cultural reconstructions. Coordination of our work with Canadian/ Russian Baikal Project and other international teams will help develop regional environmental and climatic reconstructions needed for interpreting culture history.

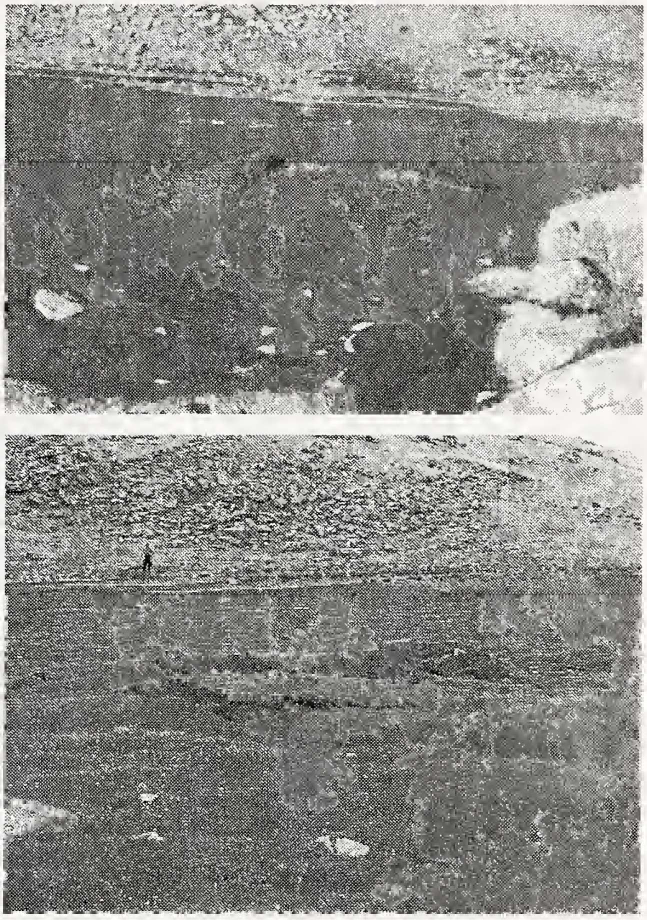

Figure 2.2 *Melting pingo north ofErkhelLake shown in 2001 (top); and after collapse in 2002 (bottom)*

(4) Lichens and Reindeer

To date relatively little is known about Tsaatan reindeer herding and its biological and environmental parameters. In 2002 Paula DePriest, a lichen specialist from the Smithsonian, began interviewing Tsaatan herders and collecting botanical samples for classification and research. Tsaatan elders, she discovered, had detailed knowledge about reindeer feeding behavior, seasonal movements, and herding strategies relating to weather, local forage conditions, predation, disease, cures, and other factors. Somewhat surprisingly, she discovered Tsaatan lichen classification closely matches the established taxonomy used in Western science, and that far more local knowledge about lichens and reindeer husbandry is available than has been recorded in existing ethnographic and botanical reports. We also discovered that the continuing Tsaatan shamanistic tradition includes extensive knowledge about medicinal and ritual practices used to maintain human and reindeer health. Future research will explore these topics and will document plant and lichen flora in a number of reindeer-impacted and non-impacted areas in each of the four seasonal feeding grounds: alpine lichen tundra (summer), mountainous larch taiga (winter), and transition zones (spring and fall). Following this research we will select field areas for studies of species presence and biomass and will initiate a pilot study of the summer feeding ground using vegetation inventory procedures developed for reindeer feeding ranges (Swanson et al. 1983). By comparing lichen species composition and biomass among different feeding grounds, we will determine if reindeer are selecting feeding grounds on the basis of lichens (Danell et al. 1994) and whether and how grazing is affecting this resource. Project biologists and anthropologists will document Tsaatan traditional knowledge concerning reindeer grazing impacts, with the goal of providing information useful for reindeer management. We will also document vegetation changes that can be attributed to global warming. The invasion of shrub birch currently spreading into the tundra pasture lands is an ominous signal of environmental response to climatic warming that poses a serious threat to reindeer habitat and Tsaatan cultural survival (Milnius 2003; Donahoe and Plumley 2003).

(5) Reindeer Domestication

To date, anthropological theories of the origins of reindeer domestication have been based on ethnographic and historical models (Ingold 1980; Snirelman 1980; Krupnik 1993) rather than archaeology or zooarchaeology, with the result that the date and place of this important transformation in the relationship between humans and reindeer remains unknown. Despite the preponderance of arctic Siberian and Fennoscandian origin theories, environmental conditions and comparative ethnography suggest that the Tuva and north Mongolian steppe/taiga border is a more likely initial domestication locale due to the proximity of reindeer habitat to the steppe grasslands where people were already utilizing domestic goat and sheep, horse, yak, cattle, and camel. Here forest hunters could have easily adapted the techniques being employed by nearby steppe herders to mountain reindeer in South Siberia, whose annual altitudinal seasonal movements between winter forest ranges and summer tundra pastures did not require long-distance annual migration of animals and people as necessitated by 'arctic style' reindeer herding. For these reasons and because contemporary South Siberian reindeer herding practices are thought to be similar to those employed by early stage domesticators, i.e. for milk, transport, and decoy hunting rather than for meat, antler and hides – as in the arctic, Russian ethnologist SevianVainstein (1980, 1981) has hypothesized that Tuva-style mountain

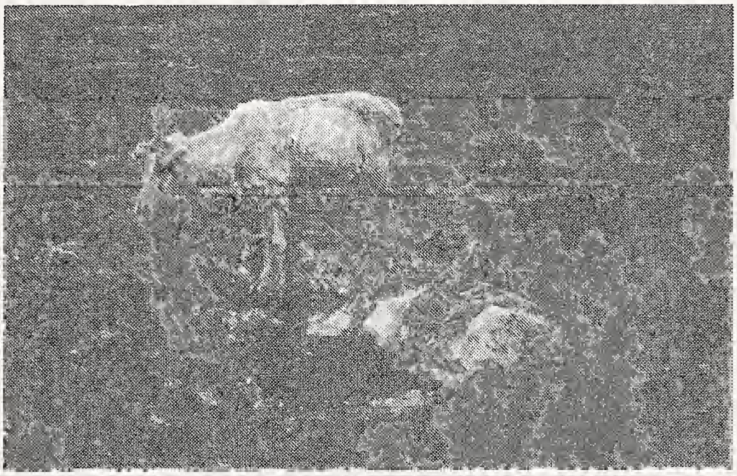

Figure 2.3 *Tsaatan reinder (note the saddle)*

reindeer husbandry may preserve elements of this early form of reindeer herding, and that reindeer domestication is more likely to have occurred here, in an area geographically marginal to the main reindeer habitat, and only later was adapted to migratory herding as utilized by Eurasian arctic peoples during the past 2000 years.

We plan to test this concept by further studies on Tsaatan ethnoecology, herding practices, species composition and abundance, and reindeer foraging behavior combined with information from archaeological evidence. Archaeological sites, including the Soya River Neolithic site (5-6000 B.P.) and others, may provide archaeofauna that may reveal changing reindeer exploitation strategies for different periods in the past. We will also try to locate reindeer fauna from existing archaeological collections in museums and research centers in Mongolia and Russia, and will work closely with Russian experts with knowledge of reindeer herding practices to test the South Siberian domestication hypothesis. In addition to the early stages of this process, we hope to explore its later developmental history as represented in the northern Mongolian region. Given the importance of reindeer herding in the transformation of northern Eurasian peoples from hunting and fishing to herding, this research will be of great importance for understanding cultural developments throughout northern Eurasia. The appearance of this technology may also mark the turning point in which the ancient spiritual relationship between the Siberian hunter and prey are replaced by new religious and world views associated with human dominance and control over the natural world (Fitzhugh 1988).

(6) Continuities and Connections: Neolithic Mongolia and Beyond

While transiting between Muron and Darkhat we noted large numbers of Bronze and Iron Age sites. Complexes containing deer stones, such as those at Ushkin Uver and Erkhel, were relatively rare compared to the abundant stone mounds, kheretsurs, slab graves and other ritual features noted in the steppe and steppe-tiaga region, wherever one could maintain sheep and goats. By contrast, habitation sites seemed nearly non-existent, other than the nearly obliterated palace of Mongke Khan. Close inspection would surely have revealed more, but it is safe to say that the northern Mongolian steppe has very different archaeological landscape than central Mongolia or the Gobi. Large sites, permanent urban settlements, and medieval complexes are rare. Archaeological landscapes catapult the viewer into the Bronze and Iron Age, whose ritual boulder features, accumulating for perhaps 1000 years, are far more numerous than the gers of modern herders. It will be interesting to see how these sites are distributed to the north and east into other areas of Northeast Asia and whether these complexes contain elements that can be linked to North Siberian, North Pacific, and Bering Sea cultural complexes.

Part III

Notes on Environment and Geobotanical Investigations in Northern Mongolia and Their Relationship to Questions of the Late Pleistocene Mammoth Steppe

Steven B. Young[1]

Topography and Glacial History

Hovsgol Province includes the northernmost area of Mongolia and borders southern Siberia. The topography is mountainous, with some peaks reaching over 3,000 meters. The other main geomorphic features are two large north to south running valleys. The eastern valley contains Lake Hovsgol, whose surface elevation is about 1,800 meters. To the west lies the Darkhat valley, which is currently mainly dry, although it contains several large lakes. The valley floor, which is clearly and old lake bed, lies at about 1,600 meters. Pleistocene glaciation of the region appears to have been mostly localized, but intense alpine glaciation seems to have occurred in the mountains that separate the Darkhat from the Hovsgol Valleys. At some time the exit drainage from the north of the Darkhat valley was blocked, presumably by a glacier, so that a large ice-dammed lake was formed. Old shoreline features can be seen at elevations up to about 1,900 meters. In the mountains along the western border of the Darkhat Valley there is evidence of numerous cirque glaciers and, apparently some valley glaciers, but the overall landscape does not appear to have been overridden by ice sheets.

Climate

The climate of the region has been mapped (Mongolian Atlas) and fairly detailed information is also available on www.weatherbase.com. Two relatively long term weather stations are listed in the region. Hatgal lies near the outlet of Lake Hovsgol, at an elevation of about1,800 meters, and Rinchinlhumbe lies on the eastern portion of the Darkhat Valley floor, at about 1,600 meters. It will be noted that the annual temperature regime of these stations is comparable to stations in the vicinity of timberline in northern and western Alaska. The pattern or precipitation is also surprising; although the annual regime is that of a typical cool semi-arid situation, virtually all precipitation occurs as rain in summer. The two weather stations lie at the lowest elevations within the region. While they may be affected by temperature inversions under some conditions, it seems safe to assume that temperatures at higher elevation are generally colder and can be predicted with some confidence on the basis of known values for the adiabatic lapse rate.

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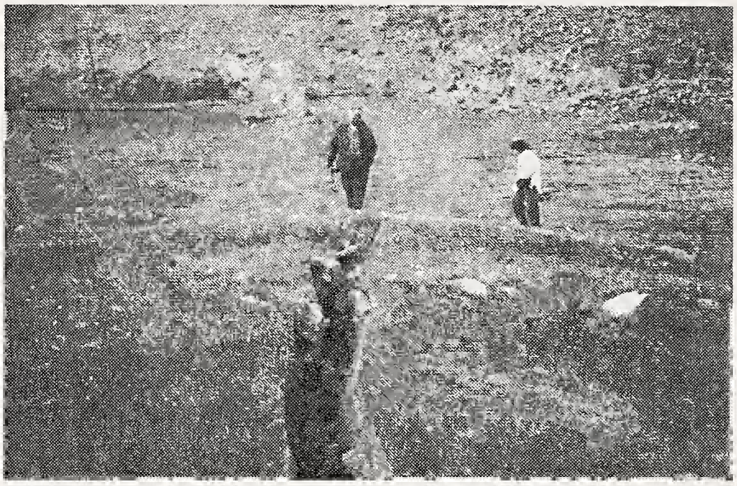

Figure 3.1 The author examines a degrading pingo

In general, the growing season throughout the region is short. A heavy overnight frost occurred on valley floors on the night of June 15, 2002. Such frosts appear to be common at any time during the summer in some situations where air drainage is impeded.

Permafrost

The entire Hovsgol area is underlain by, apparently generally deep, continuous permafrost. It is suggested that some permafrost may be residual from colder times, but the current climatic regime should clearly support deep, active permafrost. However, typical permafrost features are seldom visible. The most conspicuous features are small open system pingos, virtually all of which are rapidly degrading (Young, in preparation). Localized, evenly distributed pits and troughs on the floor of the Darkhat Valley may be the result of melt-out of ice-wedge polygons. The general lack of conspicuous permafrost features seems most likely to be related to the formation of a deep active layer during the comparatively warm, dry, sunny summers.

In some of the higher mountains a wide array of typical frost soil features occurs. On about 20 June, 2002, frozen ground was encountered in an archaeological dig (about 2,300 meters elevation) at about 50 cm depth.

Although permafrost features are relative inconspicuous, deposits of overflow ice (*aufeis*) in many of the narrow valleys and gorges leading into the mountains are widespread and extensive in early July, and some probably last throughout the year. The late-lying ice has a significant effect on vegetation, and it probably is associated with summer frosts on the valley floors.

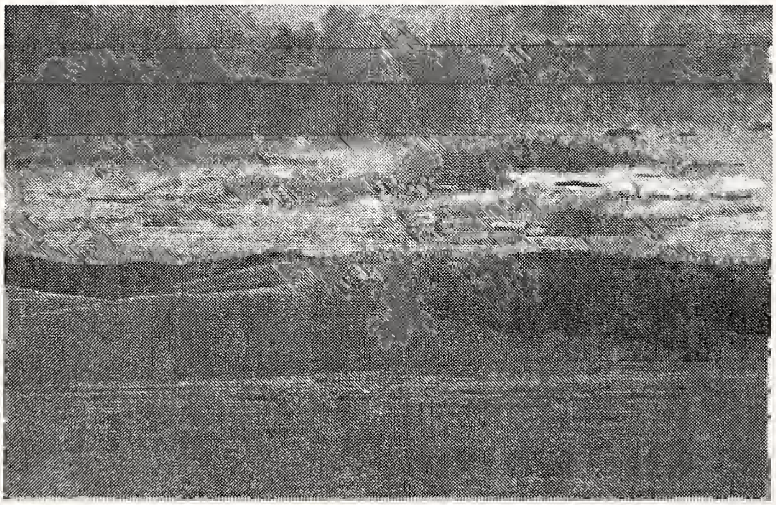

Figure 3.2 The abrupt transition zone between larch forest and dry steppe

Vegetation

The vegetation of the Hovsgol region can be divided roughly into four categories: steppe, larch forest, alpine tundra, and mesic herb/grassland. To this might be added a fifth type, wetlands, which occurs within areas otherwise dominated by each of the four main types.

Larch forest is developed over extensive areas and in all but the highest elevations. At lower elevations, it is generally confined to north-facing slopes, and the transition to dry steppe on south-facing slopes can be abrupt. North Americans who are used to the concepts of mixed species boreal forest, timberline and its relationship with summer temperature, and tundra as a treeless environment, need to rethink these concepts in light of the many features of larch forest which do not fit comfortably within our perspective. First, larch (*Larix dahurica*) is essentially the only species represented in the forest of Northern Mongolia. Stone pine (*Pinus sibirica*) is the sole exception of any significance; in some locations it may make up a significant portion of the forest at elevations of 2,000-2500 meters. Larch has an immensely broad ecological amplitude. It occurs as well-developed, extensive stands on most slopes with a northerly exposure at elevations above about 1,200 meters. These stands are generally dense and have little understory; this may be partially due to periodic fires. Fires are sometimes intense enough to damage or destroy the forest, and most older stands show evidence of fire, usually in the form of hollows near ground level, where ground fire has destroyed the thick bark.

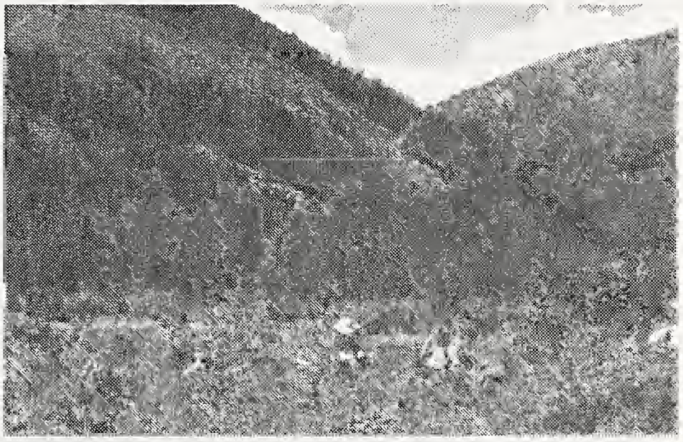

Figure 3.3 *Larch forest along the sides of a steep valley*

Larch trees generally reach their greatest size and density on the floors and sides of steep valleys. Trees regularly reach a basal diameter of one meter or more. I counted rings of a couple of stumps that were roughly half a meter in diameter. They had grown quite uniformly for about 200 years. The understory in these stands is often heavy and may consist of *Salix* species, *Rhododendron dahuricum*, *Ledum palustre* and a wide variety of smaller shrubs and graminoids. Where *Ericaceae* dominate the understory, the stands are often relatively open, with smaller trees, and are reminiscent of black spruce stands on moist, north facing slopes in interior Alaska. Where the valley floors widen out, larch may occur in scattered copses. Even where overflow ice remains into July, larch trees may be leafing out while their roots are surrounded by ice.

Individual larch trees occur far above the general timberline. Although often a bit dwarfed and scrubby, they can be common at elevations up to 3,000 meters. Extrapolating from the temperature data from the lowland stations, these trees must be growing in an environment in which summer temperatures are well below the 10 degree mean generally accepted as the limit for North American conifers. Although they constitute a significant element of the otherwise typical tundra vegetation, they do not seem to be actively colonizing any tundra areas we visited.

A final comment on the forest is that the word taiga in southern Russia refers to an open type of vegetation with only scattered trees. Thus, what is often referred to as taiga in Mongolia may, in fact, be mostly open steppe.

Alpine tundra generally occurs above about 2,200 meters, but is not found in all areas that reach this elevation. The general aspect of this vegetation would be familiar to anyone who has worked along the Bering Sea coast of Alaska. On flat areas such as valley floors it is generally dominated by wet sedge meadows. Gentle slopes are largely covered by stands of *Betula glandulosa*, in a way that would, again, be familiar in many parts of Alaska. Higher, steeper areas support *Dryas*, *Vaccinium vitis-idaea*, *V. uliginosum*, and many other familiar circumpolar species. In addition to these, a broad array of typically central Asian species is found. Among the more spectacular are *Rhododendron aureum, R. ledeborianaum, Bergenia crassifolia, Trollius asiaticus, Gentiana* sp. and *Dracocephalum* sp. Even in the high, dry fell fields, individual larch trees are often found.

The Mammoth Steppe Problem

The past 20 years has seen a growing consensus among investigators that a semi-arid steppe environment (often called mammoth steppe) prevailed in unglaciated northern Asia and Alaska during the late Pleistocene, some 25,000 to 12,000 years BP. The exact nature of this steppe is still under investigation. New techniques (Stokstad 2003; Elias and Brigham-Grette, 2001) can be expected to expand our knowledge of the composition of the ancient ecosystem. It is also important to understand the processes by which the mammoth steppe was transformed into the tundra boreal forest that characterizes the area today. Our work in 2001 and 2002 may throw significant light on this problem.

The mountains to the west of the Darkhat Valley rise to slightly over 3,000 meters. Above approximately 2,500 meters, the vegetation is dominated by a moist alpine tundra similar in aspect to that currently established widely in much of Alaska and adjacent Russia. Of particular importance is scrub birch (*Betula nana, sensu lato*), which covers extensive areas below the more desolate higher alpine areas. This alpine ecosystem is also similar to that of more northerly regions in that it provides good summer grazing for reindeer.

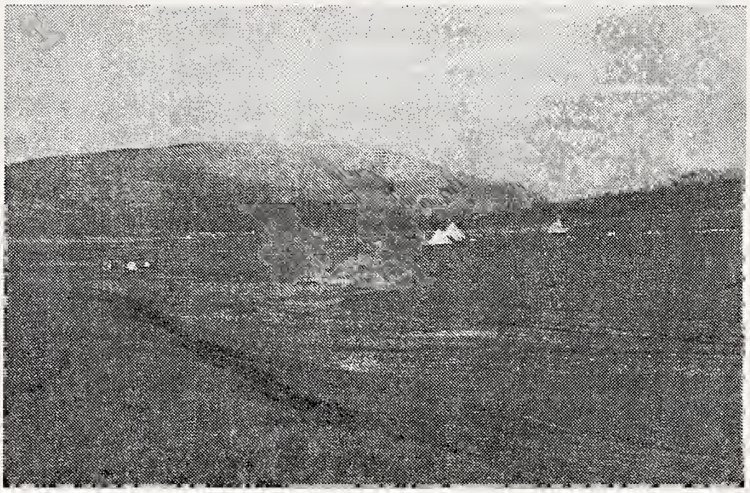

Figure 3.4 *Alpine tundra at the Tsaatan summer grazing camp*

It is well known that major changes began to occur in the mammoth steppe region at about 13,000 years BP. The most significant change as shown by pollen analysis is the rapid and widespread rise in birch pollen at that time. This leads to the so-called >birch zone,= which continues for several thousand years, or, in some cases until the present. It is usually interpreted (Young, 1982) as an indication that scrub birch rapidly rose to dominance over broad areas of vegetation. This change from mammoth steppe to birch scrub was probably highly significant in the demise of many elements of the Pleistocene megafauna that occurred on the mammoth steppe. Many of these animals (e.g. horse, bison, saiga antelope) were adapted for a grassland environment. Others, such as the wooly mammoth, are less well-known, but probably also depended on steppe, as did, indirectly, their predators.

It would be useful to know the nature of the climate change that would cause the transformation of mammoth steppe to birch scrub. Our study area in Mongolia may provide a unique opportunity to gain insight into the process. This is based on the observation that the mountains immediately to the south of the Darkhat Valley, although similar in elevation to those roughly 100 km to the northwest, support a vegetation of a true steppe character, devoid of dwarf birch scrub. Although the vegetation is radically different, the difference in climate between the two areas must be relatively minor. The most important differences may involve climatic parameters that are relatively subtle and difficult to measure. These would include the extent of cloud cover during the growing season and the amount of moisture deposited on the soil and plant surfaces directly from fog and clouds. These factors can have a profound effect on effective precipitation, evaporation, and transpiration.

The probable significance of our observations can be summarized as follows:

1. The climate of the uplands of northern Mongolia is comparable to that of modern northwestern Alaska. It can plausibly be roughly equated with the late Pleistocene climate of the area.

2. Modern Mongolian cold steppe is capable of supporting dense populations of large herbivores, as did (hypothetically) the extinct mammoth steppe.

3. The modern Mongolian cold steppe actually occurs at lower elevations, and presumably under warmer, drier climatic conditions than does the birch scrub tundra. A climatic shift leading to the expansion of steppe would be toward warmer, probably sunnier conditions, at least during the growing season.

4. The change in climate required to shift the Mongolian vegetation toward dwarf birch scrub would probably be relatively minor, no more than the current difference between the two nearby mountain ranges in the Hovsgal study area.

5. The modern ecosystems of the Hovsgol area thus provide a plausible analogue to those of the late Pleistocene unglaciated Arctic. More important, they may provide insight into the process by which one ancient ecosystem replaced another, and the climatic and other processes associated with this change.

To test these hypotheses, several lines of research might be followed:

1. Make and analyze a complete collection of the species of plants found in the two ecosystems. Special attention should be placed on getting accurate distribution data on critical species such as dwarf birch and other tundra species.

2. Begin to gather data on the local microclimate of each of two study areas, one to the west of the Darkhat Valley, the other to the south.

3. Begin genetic studies of some of the important species (especially *Cyperaceae* and grasses) of the Hovsgol region, in order to assess their evolutionary relationships with closely related species in the true Arctic.

4. Further studies on vascular plants will probably not be initiated during the coming field season, but we are in hopes of continuing this line of research in coming years.

PART IV

Field Narratives 2001, 2002

The Nef Hovsgol Expedition, 2001

Following our arrival in Mongolia on June 19, 2001, and a week of orientation in Ulaanbaatar that included meetings with officials, scientists, and logistics preparation, the Nef Hovsgol Expedition flew to Muron, the capitol of Hovsgol Aimag (District), on 25 June. In Muron, we spent a day organizing food, arranging jeep rentals, hiring a cook, and meeting with Governor Damdinsuren to obtain permissions for access to the western Darkhat Valley and the remote mountainous region between Darkhat and the Tuva border. A visit to the Ushkin Uver site a few miles west of the Muron airport acquainted us with one of the most important Late Bronze / Early Iron Age sites in northern Mongolia, containing stone mounds, kheretsur enclosures, and the largest concentration of deer stones in the province. We left Muron on the afternoon of 25 June in a caravan of four jeeps and a van and made brief visits to a small deer stone site between Ushkin Uver and Erkhel and to the large Erkhel Lake site complex (GPS Station 111-121). The latter contains scores of mounds and kheretsur and five fine deer stones, including one extremely large, extraordinarily specimen, making it an excellent target for future study. That evening we camped (GPS Sta. 1) in the Yelt Ula canyon pass northwest of Erkhel, finding several kheretsur (Sta. 3), which we photographed, and two caves in the west wall of the canyon near its southern end. At the southern end of the pass a few meters east of the stream, north of the caves, we found a 2m high geological feature which we recognized as a pingo (Sta. 2), a conical landform found in regions associated with permafrost. Northern Mongolia is near the southern limit of discontinuous permafrost, and this pingo (and others in the vicinity – Sta. 90) may be among the southernmost pingos in the world. The massive ice that forms its core was melting, and through the large cracks radiating out from its sod- and earth-covered mantle we could see the melting ice core at the base of the dome.

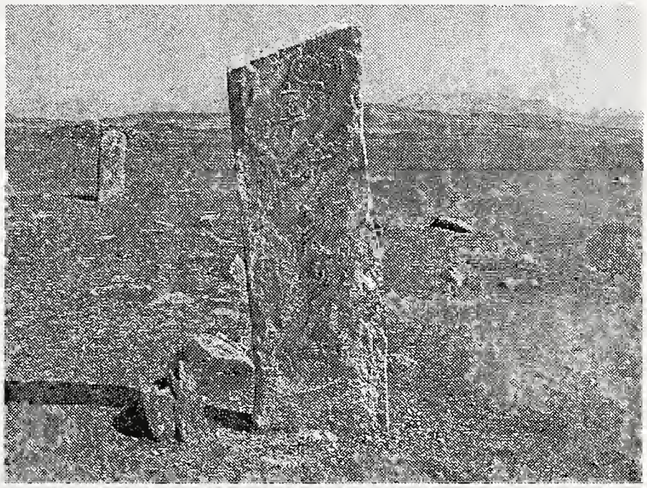

Figure 4.1 *Eroded and broken deer stone at Ushkin Uver*

On the 26th we jeeped across the highlands south of the Darkhat valley, through the town of Ulaan Uul and across the southwest corner of the Darkhat plain, finally reaching Soyö, where the Khugiin Gol (Melody River, a headwater of the Little Yenesei) exits the mountains. Here we camped for the evening, meeting the Tsaatan horsemen who were to escort us into the mountains, together with twenty horses Ed Nef purchased as a gift to the Tsaatan. One of these villages, Tsaagan Nuur, is the principal residence of Tsaatan who have given up reindeer herding. On the morning of the 27th we departed on horseback into the hills, following the valley of the Khugiin Gol, noting several burial mounds on the north side of the river a km up-stream from Soyö. After spending a night on the trail across from the last of the Mongol sheep-herding camps in the Khugin-gol, we climbed over an 8000 ft high mountain pass and entered the Minge Polog valley, a 6500 foot high lichen-rich high basin where the 'West Tundra' Tsaatan spend summers camped in three clusters along the river. Subject to cloudy, wet 'mountain weather,' the Minge Polog receives a large amount of rainfall during the summer, making it an ideal climate for lichen growth. Its vegetation is a grassy tundra, with patches of dwarf birch and isolated young larch trees, both of which appear to be expanding their range across the hillsides.

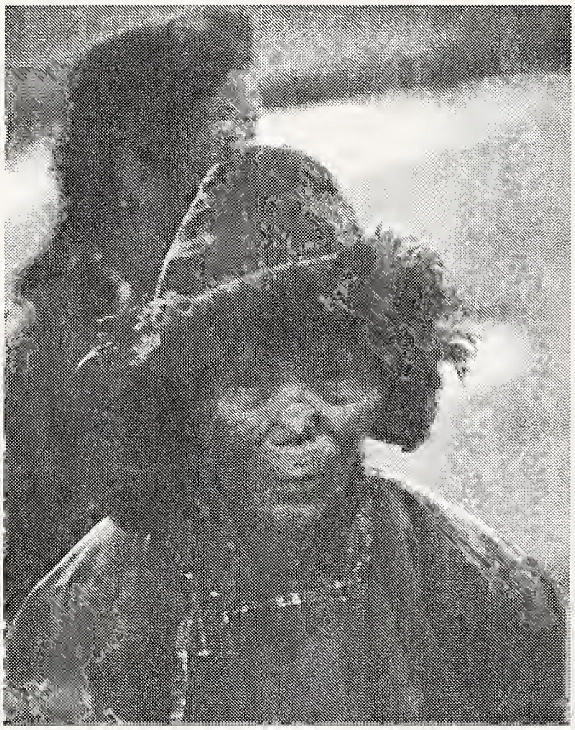

Figure 4.2 *Suyan, the famous 96 yr-old Tsaatan shaman, in 2001*

On the 29th I noticed a depression in the east side of the Tsaatan camp ground, a short distance from Batsaya's tent, and found a flake of black chert on the ground nearby. The depression gave the appearance of an old pithouse with an entranceway. This brief three-day stay with the Tsaatan was more of a social than a research visit, and I had little time to make an archaeological survey, but my short excursions near the village did not produce evidence of other old sites. Most of visit was spent discussing Tsaatan concerns, exchanging gifts, socializing, and drinking reindeer milk tea. One of the highlights of the visit was a meeting with the 96 years old shaman Suyan. In addition demonstrating her shaman robe, headdress, drum, and other equipment, she told us about her life and efforts to maintain the spiritual and physical health of the community and its reindeer.

We returned to the Darkhat Valley by a different route, via the pass at the northeastern end of the Minge Polog valley, passing through a thick larch forest in which some Tsaatan families spend the winter in more sheltered conditions, and out onto a finger of grassy steppe that contained burial mounds and rock features marked with standing stones. Some of these slabs had small circular pits cut into their surfaces that indicated they were simple types of deer stones. Re-joining the jeeps, we then traveled to Tsaagan Nuur where we spent the night at a small guest house run by a Tsaatan family, and in the morning toured the much-dilapidated village school. Flint flakes and ceramics along the lakeshore near the village indicated an archaeological site in the vicinity – a likely prospect considering the excellent fishery in the lake. During our return to Muron we visited the Mongke Khan archaeological site, saw the horse-shoe rock carvings nearby, and stopped briefly again at Ushkin Uver to inspect the many burial mounds and kheretsur located along the base of "Lung Mountain" west of the deer stone site. The huge number of stone monuments and burial features made the location look like a Mongolian version of Egypt's "Valley of the Kings."

After a brief stop in Muron, we set out to the north again, this time to visit Lake Hovsgol, where we spent two nights at a small tourist camp, "Khokh Tenger Khovsgol," During the day I surveyed a short distance along the Hovsgol shore, noting eroding hearths and a possible pithouse. A small test pit here produced only charcoal. A gravel pit on the west side of the road a few hundred meters south of our camp produced a few silicified slate pieces with unifacial flaking that seemed of 'paleolithic' morphology, but I could not isolate a culture zone or horizon in the pit. Local people we met had no knowledge of archaeological sites from the southwest shore of the lake, other than Bronze Age mounds. The shoreline in this area of the lake is eroding from rising lake levels. We returned to Muron on 6 July and flew back to Ulaanbaatar the next day.

The major results of the 2001 project can be summarized. Archaeologically, the greatest resource is clearly the Late Bronze Age and early Iron Age occupations, whose monument sites – including deer stones, kheretsur, and burial mounds – are found singly, in small groups, or concentrated in large complexes near lakes and rivers in grassy steppe zones wherever sheep and goat herding is possible. These sites were not found in the forest or tundra environments we visited. Other types of archaeological sites are much less obvious and are infrequently found. The Erkhel Lake site offers an excellent opportunity for research as it is a mid-size deer stone site that is relatively intact, although we learned that one or two of its deer stones had been raised and cemented in place by Sanjmiatov and his Mongolian and Russian partners in 1992-3. The Tsaatan pithouse offered a possibility for studying pre-herding exploitation of this tundra zone, and Tsaagan-nuur seemed likely to produce a variety of archaeological sites. The west shore of Hovsgol is less productive archeologically, although the Lake Hovsgol outlet at Hotgol must have a long occupation history.

Prospects for ethnographic and environmental study are equally promising. As one of the few remaining reindeer herding groups of southern Siberia, Tsaatan culture and adaptation needs urgent ethnographic study. The same is true of their Dukha language, ritual, and belief systems. A detailed study of Tsaatan reindeer husbandry is especially important in relation to theories of reindeer domestication, the variant forms of reindeer husbandry and their development, and their geographic spread. Studies of Tsaatan relationships with Mongol groups living nearby on the steppe, and with Siberian Tuva-speaking groups to the north, may shed light on the processes of ethnic and culture change and environmental interactions that have characterized the steppe-taiga transition through time.

Figure 4.3 *Tsaatan reindeer on their summer quest for salt*

Finally, the climate and environment of the Hovsgol-Darkhat region and its influence on cultural development need study, both in their own right as well as for their impacts on cultural development. Steve Young's discovery of a layer of old wood eroding from the banks of the Khugin Gol at Soyö (now radiocarbon-dated to 6090 B.P.) offers tantalizing evidence of early forest and climatic history that may be correlated with Darkhat Lake level dessication, fossil lake terraces and beach lines, and regional pollen and dendrochronological series (Jacoby et al. 1996; Peck et al. 2002). Such fossils will help contribute to interpretation of vegetation and landscape history and climate change in post-glacial times. Young's hypothesis that the modern vegetation of high tundra-grasslands in the massif between Muron and Darkhat, and vegetation in the mountain tundra regions west of Hovsgol and Darkhat, resembles the flora of the ancient Bering Land Bridge, and the parallel concept that northern Mongolia may have been the source from which the vegetation (and perhaps fauna) of the land bridge derived, offer potential for new understandings of biotic and human connections between these regions.

In short, Mongolia's relations to the Arctic regions of Eurasia and potentially to North America during the past 15,000 years make it an important area for a wide range of environmental archaeology and cultural studies whose implications range beyond Mongolia and its Eurasian arctic connections and history of reindeer domestication to such topics as the peopling of the New World, origins of ancient Eskimo art, and the development of reindeer domestication. The fact that modern climate is warming in ways that may threaten Tsaatan cultural survival makes documentation of their reindeer husbandry system urgent and important. The current efforts to document Hovsgol's biotic and physical ecosystem being conducted to support its proposed designation as a World Heritage site by Clyde Goulden and colleagues (Anonymous 2000) concentrate on biological rather than on cultural and historical studies. The work outlined here would be an important contribution to broader understanding of the Hovsgol region, today and in the past.

Figure 4.4 *A young Tsaatan jockey, with Sanjin*

The 2002 Smithsonian Reconnaissance

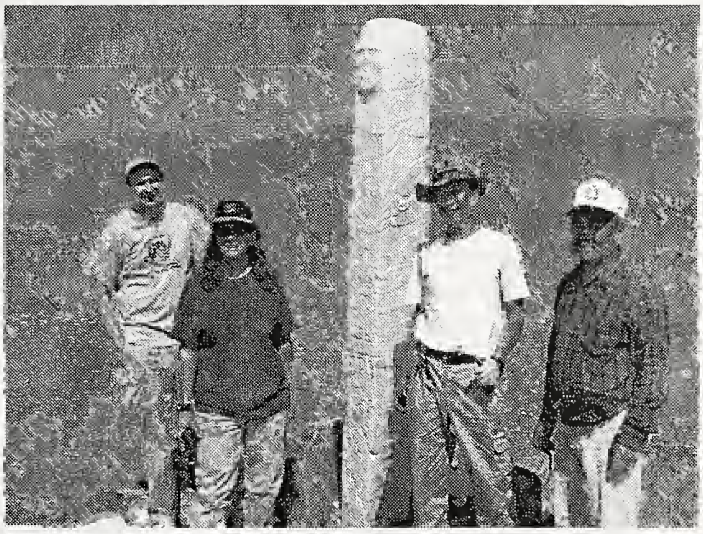

Figure 4.5 *The casting team at Ushkin Uver: Paul Rhymer, Carolyn Thome, Ochirkhuyag Tseveendorj and Ayush*

Our second visit to Hovsgol took place between 14-26 June, 2002, and was framed at either end by several days in Ulaanbaatar. Whereas the 2001 expedition was devoted to introductory work, the 2002 project explored opportunities for archaeology, ethnology, botany, paleoecology, and cultural heritage. The expedition composition reflected these goals. Smithsonian botanists Paula DePriest and Sue Lutz explored the natural history of lichens and the lichen-reindeer-herding relationship; Ts. Tsendeekhuu provided expertise on local botanical taxonomy and ecology. Steven Young pursued palaeoecology and Beringian connections; William Fitzhugh worked with T. Sanjmiatov and Mongolian students, surveying and testing archaeological sites; and O. Sukhbaatar provided knowledge of Tsaatan culture and geography. Field work was concentrated in the West Darkhat region with additional work along the route between Muron and Darkhat. An important part of the project was devoted to obtaining a cast of a deer stone for use in the Smithsonian venue of the *Modern Mongolia* exhibition, opening at the National Museum of Natural History in June.

The scientific team arrived in Muron on 14 June with Smithsonian model-makers, Carolyn Thome and Paul Rhymer and two representatives from the Mongolian Museum of Natural History, Ochirkhuyag Tseveendorj and Ayush. That evening we visited Ushkin Uver and decided to cast its well-known 'face stone,' regarded as one of the most important deer stones in Mongolia. The expedition departed for Darkhat the next day, leaving the deer stone casters to complete their work and return independently to the U.S. where they completed the replica and installed it in the *Modern Mongolia* exhibition. The science team spent the afternoon of the 15th inspecting the small deer stone site south of Erkhel, and the Erkhel site once again, deciding to return to make a small excavation. Camp that night was at the river site where we had lunched in 2001 (Sta. 5).

Figure 4.6 *Camp at the Soyö Neolithic site, view West*

The next morning, while traversing one of the high valleys northwest of our evening camp, we found three more pingos (Sta. 90); two were still frozen, and one had collapsed. We stopped briefly at Ulaan Uul, crossed the Baltan River ford at Sta. 91, and reached Soyö on the Khugin Gol by late afternoon. Here we met local government and military authorities who cleared our project for Darkhat and informed us that two geologists who had strayed too close to the Russian border earlier in the year had been shot and killed by Tuva frontier guards. We were cautioned not travel west of Djamps, a former Tsaatan herding territory located a few miles west of their current village site on the Minge Polog. That evening I found microblades, red-painted pottery, bones, and hearth remains eroding from a buried soil horizon in the river terrace near our Soyö campsite (Sta. 92). The next morning (17 June) while our gear and horses were being prepared I sketched the site and collected samples. We left about noon for the mountains with a large retinue. Shortly after crossing the Soyö ford we found a site with burned slabs, ceramics, and bone in some blown-out sand dunes (Sta. 93), but had no time for investigation. A short distance further I noted scattered animal bones in the north bank of the river (Sta. 94), but found no cultural layer. Our evening camp was at last year's site (Sta. 95), and here the next morning Paula visited a winter reindeer winter pasture on a hill south side of our camp with the Tsaatan elder and reindeer specialist, Sanjiim. We reached the Tsaatan village (Sta. 97) in mid-afternoon on the 18th. Sanjmiatov and I surveyed a few miles west along the Minge Polog, finding three abandoned Tsaatan summer camp sites on the north bank and one on the south bank (Sta. 98) with numerous hearth areas, manure piles, and a partial circle of a mounded earthen ring that had served as a tent base. These camps appeared to have been abandoned about a decade ago.

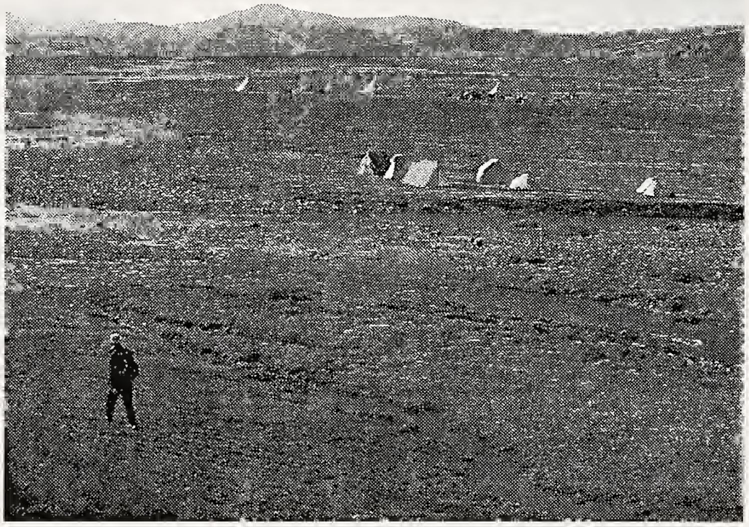
Figure 4.7 *Tsaatan and expedition camps on the tundra, Baran-gol River*

On the 19th I consulted with the village leaders and received permission to test the pithouse. Batsaya's family, whose tent was near the site, agreed. The project took two days, and for the duration I was assisted by several of the children and men. Three short trenches were excavated across the upper, middle, and lower portion of the depression (fig. 4.8). The results (see below) were confusing and inconclusive, suggesting the feature was more 'pit' than 'house' and may have had three occupation periods. Equally ambiguous was the collection

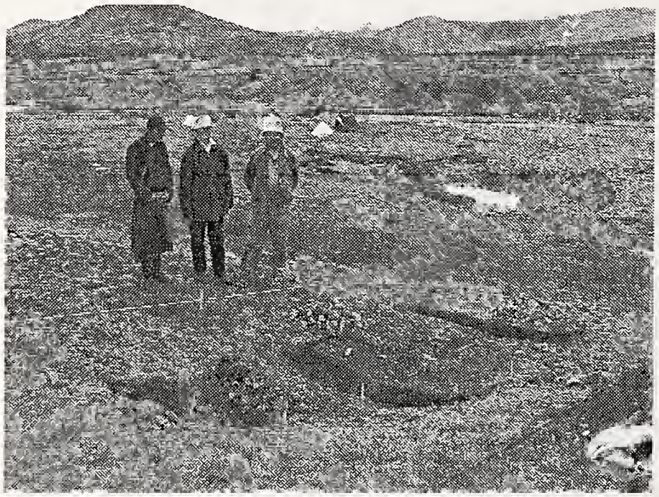
Figure 4.8 *Pit house test excavations, view east*

Figure 4.9 Damaged Bronze/ Early Iron Age Rock Art site on the Khugin Gol

of crude quartz flakes and cores. While we were testing the site, Paula, Sue, and Steve investigated the region's botany, reindeer herding practices, and gathered information about Tsaatan seasonal camp and reindeer movements. Before our departure we met again with Suyan, the shaman, on the evening of 20 June and heard more about her life and work and work. On the 22nd we took the northeast pass (Sta. 99) out of the valley, leaving the botanists at Sta. 100 on the edge of the Darkhat plain to study the flora at one of the Tsaatan winter camp locales while the archaeologists visited a Bronze / Early Iron Age rock art site on the north side of the Khugin Gol a few km. northeast of Soyö (Sangimiatov 2003). We found the rock art site had been defaced by local people who stripped off parts of its red-painted images for sale; some pieces had made their way to UB where they were identified from a previous publication of the site.

On the 23rd we made a long jeep run south toward Erkhel, passing over the high terrain (Steven Young thought it resembled 'mammoth steppe') that rises nearly 7000 feet (Sta. 106) south of the Darkhat valley. That evening, while camped at the top of a prominent hill 25km north of Erkhel, we discovered a set of shaman's equipment (Sta. 109) cached in a narrow crevice in the rocks, looking like it had been placed there 10-20 years ago. The next morning we photographed and sketched the objects, then returned everything to its original location. We arrived at the Erkhel site that afternoon, and for the next day and a half – June 24-25 – explored the region, took GPS readings, and made test excavations at the base of deer stone #4.

Figure 4.10 Crew at Erkhel Lake site

Two other finds from Erkhel should be noted. While exploring the site we found that a kheretsur (Sta. 119, 5.17) on the hill above the deer stone complex had been looted only days earlier. The stones had been thrown from the center of the mound to a depth of one meter below the ground surface, and the skull and a few other bones of the deceased had been left in the pit. Elsewhere, I found a possible Paleolithic discoidal core in the litter around a marmot burrow (Sta. 121). We arrived back in Muron on the evening of the 25th and on the 26th flew to UB with the crew.

Figure 4.11 *Tsaatan friends, including Ulzii, a blind elder in center*

The 2002 excursion was important in establishing the feasibility of more detailed studies of Tsaatan reindeer herding. In particular, we now feel confident that the Tsaatan can provide important information on ethnobiology, reindeer husbandry, pasture health, and botanical conditions, and we may be able to link these issues of climate warming, vegetation shifts, and changing social and economic conditions. The Tsaatan have extensive knowledge of their lands and resources, and how their reindeer respond to environmental change. They eagerly assisted our inquiries and welcomed archaeological and environmental studies. Our test of the tundra pithouse was not conclusive, but discovery of a Neolithic site at Soya, with bone, charcoal and lithic and ceramic specimens is an important find, being one of the few Neolithic sites known from the Hovsgol region. (In 2002 a Russian-American team found Neolithic traces on the East Hovsgol shore – pers. comm. from John Olson.) The Soya site may allow correlation of human occupations with Darkhat Valley lake level and paleoenvironmental change. Erkhel also showed promise for landscape archaeology, dating, and functional studies. Discovery of a shaman's cache pointed toward changing religious and social conditions in the Mongol-occupied lands in the southern Darkat where shamanism is rarely practiced today. Its contents were remarkably similar to a cache the author found in Yamal, Western Siberia, in 1994 (Fitzhugh and Golovnev 1998). Finally, the discovery of more melting pingos further documents a pattern of recent warming in regions that must have been considerably colder in previous decades. This trend is also suggested by the expansion of dwarf birch and larch into the West Darkhat tundra reindeer pastures.

Deer Stone Documentation and Preservation

A major accomplishment in 2002 was the casting of the large human face deer stone from the Ushkin Uver site near Muron. This task was completed by Carolyn Thome and Paul Rhymer of the Smithsonian's Office of Exhibits Central, assisted by Ochirkhuyag Tseveendorj and Ayush of the National Museum of Mongolian History (NMMH). Arrangements for making the cast and bringing the mold back to the Smithsonian's model shop were made by joint agreement between the Smithsonian and the NMMH. Two casts were prepared from the mold, one of which was installed in the exhibition, *Modern Mongolia – Reclaiming Genghis Khan*, which was on display at the Smithsonian's National Museum of Natural History from June through December 2002. After the exhibit closed the deer stone was put on permanent display near the entrance of the Hall of Asian Peoples. The second replica and the original mold is being shipped to the National Museum of Mongolian History for installation. A report on the deer stone casting was published in the October 2002 issue of *Smithsonian Magazine*.

One of the reasons for making the replica was to demonstrate the capabilities for latex casting as a method for documenting and preserving deer stone monuments in the field in Mongolia. The procedure is not difficult to learn and could be accomplished by training museum specialists in Mongolia. However, care must be taken to ensure that the surface of the stone is sufficiently intact, solid, and without crevices and pores that could be damaged while separating the latex mold from the stone. For this reason an experienced conservator familiar with the procedure is necessary. While the discussion continues in Mongolia and elsewhere about the best method to preserve deer stones and other exposed monuments from damage from natural and human causes, latex casting provides a relatively safe, simple, and inexpensive method of replication. This method can accurately document carved decoration and inscriptions, and can also faithfully record the surface qualities and granularity of the stone. Once cast, an experienced model-maker can then accurately render even the color and surface texture. Latex casting thus may facilitate decisions about how best to preserve and document Mongolia's monuments, whether by removing them after careful archaeological excavation and replacing them with exact replicas, or by making replicas to serve as 'voucher' copies of originals in the field, stored in museums or other secure locations.

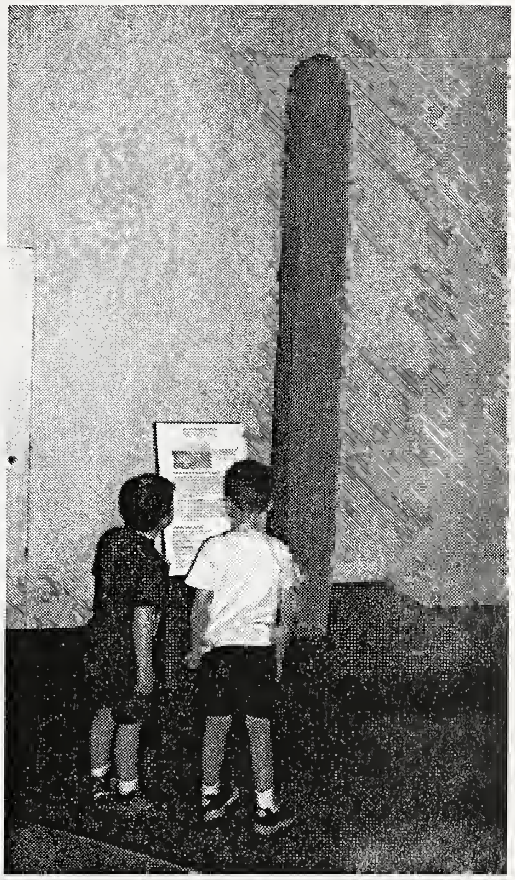

Figure 4.12 *Young visitors at NMNH enjoying the Ushkin Uver deerstone cast*

PART V

Traditional Knowledge of Lichens by Mongolia's Dukha Reindeer Herders

Paula DePriest

Dukha Reindeer Herders of the Darkhat Valley in northwestern Mongolia are dependent on lichen-dominated feeding grounds of the tundra and taiga for the survival of their domesticated reindeer herds. Their traditional knowledge includes a sophisticated recognition and nomenclature for lichen species in these feeding grounds. Our examination of summer feeding grounds on the tundra verified the presence of 11 common lichen species, each with a corresponding Dukha name. As a result, these herders have the taxonomic tools to access the condition of reindeer feeding grounds on the basis of the abundance and health of individual lichen species.

Reindeer (*Rangifer tarandus)* are adapted to feeding on lichen, the fungi that form symbiotic associations with photosynthetic algae or cyanobacteria, that are important components of tundra ecosystems. In northern Europe and Asia lichen represents a major portion of the forage of wild and domesticated reindeer especially in winter months when reindeer lichen represent 60-70% of the reindeer's food intake (Boertje 1984). This is true especially for the speciose and highly conspicuous lichens such as the *Cladonias*, which carpet wide expanses of northern forests and arctic tundra. Estimates of their biomass have exceeded 300 g/m3 and their cover 40% (Manseau 1996). Reindeer grazing can have a significant impact on the lichen biomass in these communities (Bowertje 1984; Väre et al 1996), and recovery after intense grazing may require 10 to 20 years (Pegau 1968) and careful management.

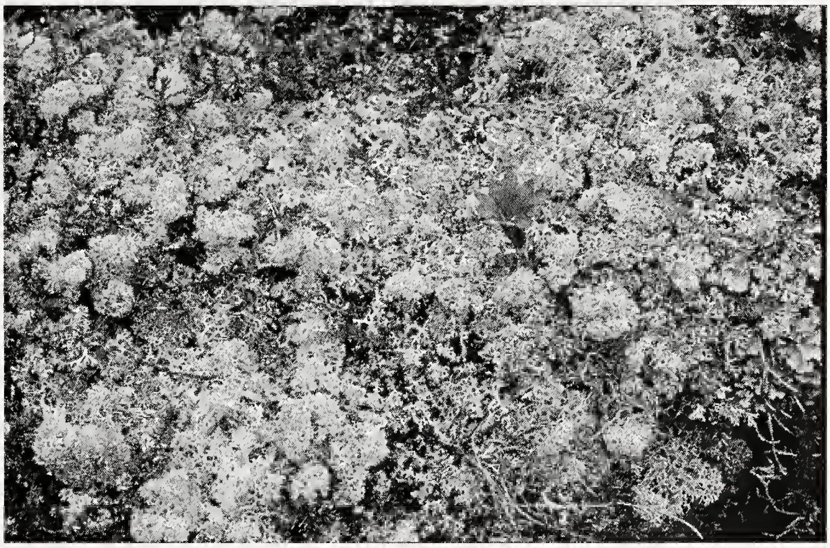

Figure 5.1 Cladonia stellars or 'Reindeer lichen'

Traditional reindeer herding communities in northern Mongolia provide an opportunity to examine the linking of lichens, reindeer, and reindeer herders. Three levels of questions can be addressed. 1. Are reindeer feeding grounds associated with certain dominate species of lichens? 2. Are reindeer herders selecting feeding grounds on the basis of their traditional knowledge of lichen taxa and biomass? Do herders recognize and identify lichens and particular lichen species? 3. Is reindeer grazing effecting the lichen communities and populations? How does reindeer grazing and dispersal effect population size and genetic variability of reindeer lichens? These research questions are critical to understanding selection and possible coevolution between lichens and reindeer as a part of reindeer domestication.

The Dukha (variants Tofa, Tuba, Tuha, Tuva, Tyva), or in Mongolian Tsaatan literally 'reindeer possessing people,' are nomadic hunter-gatherers (Plumley and Baattulag 2000) from the Hovsgol Aimag (Province) of northwestern Mongolia. At present, the approximately 400 Tsaatan (2000 Mongolian census) live in two Soums (Districts), Tsaggan Nuur and Ulaan-Uul Soums. Nomadic Dukha, under 200 individuals representing 32 family groups, live in summer camps to the east and west of the Darkhat Valley, each including 20 to 150 individuals. Together camps herd approximately 700 reindeer (*Rangifer tarandus*) down from a maximum of several thousand during the Soviet-dominated eras, moving them from summer feeding grounds on the tundra to winter feeding ground in the deciduous larch taiga. In the fall and spring the herds are held on feeding grounds near the junctions of these biomes. In contrast to wild reindeer of the high Arctic, these woodland reindeer do not migrate long distances, but instead are herded among different elevations within a relatively small geographic range. The reindeer provide milk and cheese, hides and felt, transport and transportation and, only rarely, meat in this subsistence culture.

The Dukha ethnic group is related to Reindeer Herders of the Tuva Autonomous Region and eastern Siberia of Russia, and traditionally remained in close contact through trading, intermarrying, and sharing of hunting territories (Plumley and Battulag 2000; Wheeler 2000). However, most recently they have been separated and their herding ranges reduced by closing of the Russian-Mongolian border. (In part, the Dukha, are descended from Tuvan reindeer herders that fled to Mongolia to avoid collectivization after 1944.) The Dukha peoples maintain their native language 'Hovsgol Uigur,' a dialect of Tuvan in the Turkic language family. 'Hovsgol Uigur' is heavily influenced by Khalkha Mongolian and is not mutually intelligible with other Tuvan dialects. At present an estimated 200 people speak 'Hovsgol Uigur' and 235,000 Tuvan. These languages are related to an ancient 'Uighur' language (attributed to Bold in A. Enebish IIAS Newsletter Online No. 26). For example, in 'Hovsgol Uigur' lichen is "shulan" (variant "shulung"), and in Khalkha Mongolian "khang;" both are used and recognized by the Dukha. The Dukha are also fluent and literate in Mongolian using either the traditional vertical Mongolian script or Russian Cyrillic alphabet. Reindeer herding among the Dukha and Tuvan people probably dates back several thousand years (Vainstein 1980; Solnoi et al. 2003), and represent one of the oldest and most southern reindeer-herding cultures. It has been proposed as the region where reindeer were first domesticated 3,000 to 5,000 years ago and the source of their latter export throughout the Arctic.

In June 2001 and 2002, we traveled to the summer feeding grounds of the Dukha west of the Darkhat Valley near Ulaan Taiga. The feeding ground is alpine tundra with meadows, marshes, birch shrubs, and fell fields. The grasses, sedges, herbs and green twigs are an essential source of protein and minerals for the reindeer, although lichens are their mainstay. The meadows and marshes also are used for grazing of horses, increasing efficiency of reindeer herding, and some cows, goats and sheep important to supplement their diet. In summer most of the reindeer herd wanders freely, with calves and some female reindeer used for milking and transportation kept tethered or hobbled near the camps. Lichens are the major source of carbohydrates for the reindeer and are found in all areas of the feeding ground and. In the birch shrub and fell-field zones lichens approach complete ground cover. From these two areas we identified approximately 30 lichen-forming fungal species, eleven of which are widespread and abundant. Of these several are included in the Mongolian Red Book (Shiirerdamba 1997). We observed the effects of reindeer grazing in the camp. In the meadows nearest the settlements the lichens have been nibbled down but left rooted in soil or mosses – the rooting is critical for their recovery (pers. comm.). In a more distant feeding ground, along the Jamts River (orthographic variant Jams), not used for over 15 years, the lichens could reach depths of 10 cm. Occassionally wild reindeer have been reported from this sight (citation).

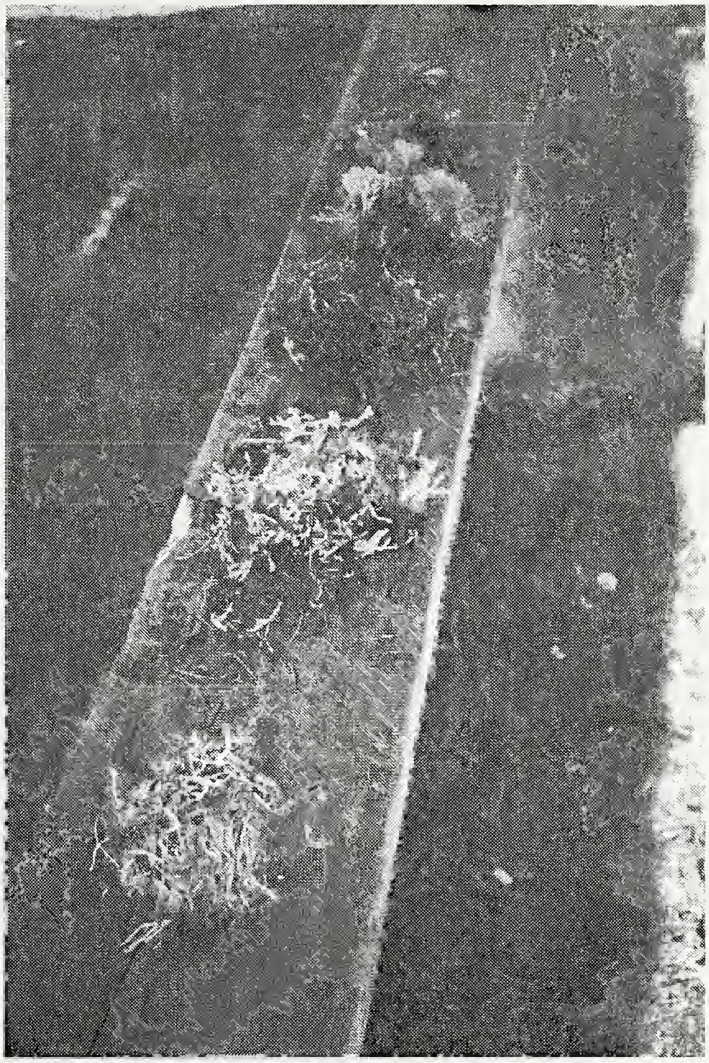

Figure 5.2 A sample of the different lichen species found in the Tsaatan area

Our Dukha guide, Sanjiim, was able to distinguish and provide names for the dominant lichens in the habitat. Most of the names represent descriptor and either the 'Hovsgol Uigur' or Mongolian name of lichen, shulan or hag, respectively, and therefore correspond to the universal form of Linnaean binomials and other folk taxonomies in representing a noun and adjective combination (Stevens 2002). For example, bujirach shulan, corresponding to the lichen-forming fungus *Cladonia stellaris*, is white lichen and garat shulan, *Bryoria*, is brown lichen. Other names use the Mongolian hag: jar hag is *Peltigera* and dals hag *Umbilicaria*. Because the guide linked actual lichen specimens and names, we did not explicitly test the circumscription of the names by modern concepts nor did we examine higher classification concepts. For example, for many genera on one species is present in the site, therefore, we don't know if other species of the same genus would be distinguished with a distinct name. In the case of *Cladonia* and *Cetraria* different species had distinct names, however, species within a genus did not share nouns in a way that would indicate their hierarchical relationships. Nor do they seem to acknowledge the dual nature of lichens, their composition from fungus and algae, in these names as is consistent with traditional and vernacular lichen taxonomy in other cultures (examples). One interesting example was *Cladonia rangiferina*, named by Linnaeus in recognition of its association with the reindeer of Lapland. This lichen occurs at low frequency and abundance in the summer feeding grounds and is called 'Tsaa hag,' in Mongolian literally reindeer lichen. Dukha lichen taxonomy is therefore utilitarian and focused on the use of lichens for reindeer feeding.

Dukha knowledge of lichens includes preference for feeding. For example, Sanjiim noted that reindeer will eat bujirach, *Cladonia stellaris*, and gatig hag, *Cetraria*, in all of the seasonal feeding grounds. In contrast, the lush mosses associated with lichens in the feeding grounds apparently are not eaten by the reindeer at any time of the year. Two lichens were noted as important for seasonal increases in the weight of reindeer, and indication of their increased health, with lush colonies of bujirach and gatig hag leading to fattened reindeer. For this reason the herders warn against disrupting these lichens from their loose rooting in the soil or mosses because they can not become rooted again and will die. Although the feeding ground used in 2002 show the effects of grazing by comparison to the Jamts area that has not been grazed for over 15 years, it is still adequate for the current level of around 700 reindeer. Increases in the herd size will require moving the herd more often or into currently unused and more remote areas.

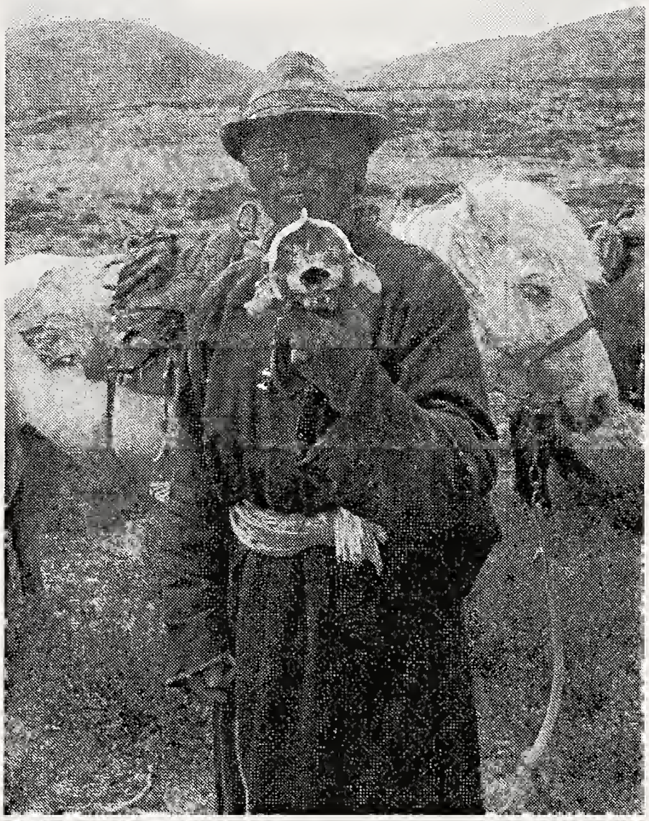

Figure 5.3 Sanjiim, our Dukha informant, displays a bear skull covered with Caloplaca lichen

The Dukha people, and their traditional knowledge of lichens, are on the edge of extinction. One of the major goal of the International Convention on Biological Diversity is that traditional knowledge about plants and animals held by indigenous peoples and local communities must be respected, preserved, and maintained. At present the Reindeer Herders of Mongolia are threatened by the diminished size and lack of veterinary care for their reindeer herds, loss of herdering salaries present in the Soviet system, and the geopolitical partitioning of their traditional grazing grounds, and pressures for more sedentary lifestyles. Furthermore, large-scale global warming and landscape changes potentially will degrade their feeding grounds. These limits threaten not only the ability of the herders to continue their hunting gathering lifestyle, but also threaten the loss of their symbiotic knowledge of reindeer and lichens. Without domesticated reindeers and the reindeer herding culture, the Dukha's traditional knowledge of lichens will be lost forever.

PART VI

Archaeological Site Reports

The archaeological work of the 2001 and 2002 expeditions was constrained by the short period of field work and by the rapid travel schedule. The vast majority of sites noted were Bronze and Early Iron Age stone mounds and features, some of which we photographed and located by GPS. It was possible to study only a few of these sites, and only the Erkhel and Minge Polog sites were tested. During the two seasons, only a few artifacts were collected: none in 2001 and less than fifty in 2002. The latter and a few faunal and dating samples were turned over to the National Museum of Mongolian History. The human skull and the few post-cranial bones recovered from the looted Erkhel burial mound were deposited by Sanjmiatov at the physical anthropology laboratory in UB. In early 2003, NMMH sent a few bone and charcoal samples obtained in 2002 to the Smithsonian for radiocarbon dating. All dates received are reported here. The following sites received specific attention.

Yelt-Ula Canyon

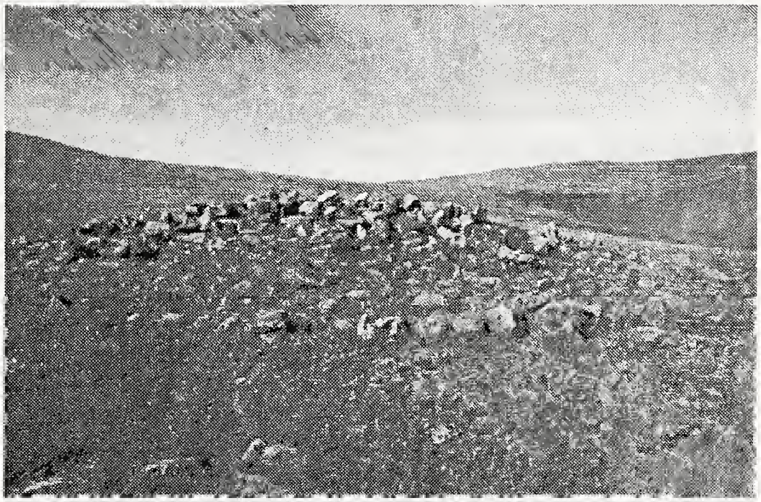

Figure 6.1 Northern Kheretsur in Yelt-Ula Canyon

During the first night of our 2001 excursion we camped north of the Erkhel Plain in Yelt-Ula Canyon, where a small stream has cut a deep pass through the hills. This pass is an important travel route between Muron and the Darkhat Valley. A few hundred meters north of our campsite I found two kheretsur on a grassy ridge isolated from the main canyon by a small tributary to the east so that it projected south into the canyon (Sta. 3). The center of the northern structure was a one meter-high domed rock mound about 10 m in diameter, surrounded by a 20m diameter ring of close-packed rocks whose northern arc expanded into a box-like rectangular enclosure. Beyond the boulder ring was a series of about 15 small round or oval enclosure features about 0.5-1.0m in diameter, concentric with the central mound and its surrounding boulder ring. This pattern is typical of the '*circle*' kheretsur type found in the Hovsgol region. The arrangement of the rocks in the mound looked like they had not been disturbed. A second, smaller stone mound was found 20-30 m to the south, near the south end of the terrace. The sites were photographed. No cultural materials were noted on the surface, and no sub-surface testing was done.

While camped here on our return trip I located a second kheretsur complex on the west side of the main canyon stream (Sta. 23-25) where a jeep track leaves the canyon road and proceeds up the west wall of the canyon. Of the two kheretsur found here, the lower (eastern) one a few meters above the valley road consisted of a large mound (S1, Sta. 23) with heavy blocks surrounded by a *square* boulder enclosure with corner features, and a smaller rock mound (S2) with no boulder enclosure, lying uphill to the east of the large mound. A third stone structure (S3, Sta. 24) up-slope from S2 consisted of an oblong boulder enclosure (3m by 10m) with standing plinths positioned at each end. Nearby, north of these structures, up-stream, and across the road, we found several depressions in the bank above the stream that might be pit dwellings or graves, without stone mounds. A rock ring 5x8m in dimension (Sta. 25) was noted 200m to the east of the Sta. 23,4 group. No excavations were made, nor samples or artifacts collected.

Returning through this valley in late June 2002 we inspected two prominent caves in the lower part of the canyon, one on the west side about 25m above the canyon floor and the other near the road on the east side. The west wall cave had a large chamber and its soot-covered walls indicated periodic use by shepherds. This cave seemed to have good prospects for archaeological deposits, but other than a few pieces of old-looking bone, we found nothing on the floor or talus below the cave entrance. The west canyon cave was more of a shelter than a cave and did not contain any obvious archaeological material.

Minge Polog 'Pithouse'

In 2001, while scouting the edge of the Tsaatan tundra camp located at Minge Polog, a tributary of the Little Yenesei, 20 miles east of the Russian border, I found a 7 by 8 m. saucer-shaped depression with what appared to be an entranceway cut into the terrace front. A few flakes of black chert were eroding from the surface at the lower portion of the depression. The site was located in the middle of our Tsaatan hosts' summer camp, and when I inquired about excavating I was told that the Tsaatan had a taboo against digging. Like other Siberian people, they believe that the earth was the abode of the ancestors and should be disturbed only by creatures like reindeer and burrowing animals, not by humans with shovels and trowels. Fortunately, when I returned in 2002 and the village leaders, they expressed interest in seeing what I might find. Just to be safe, Sanjmiatov produced a small piece of reindeer antler tine to make the first stroke to remove any possible distress.

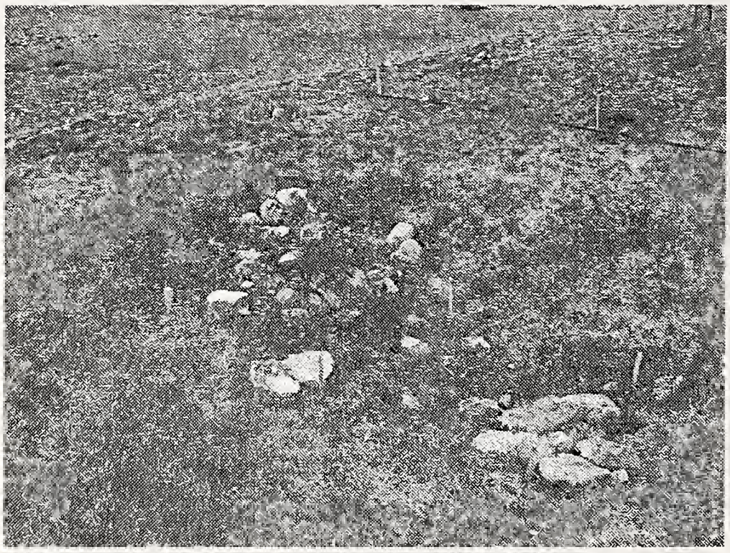

Figure 6.2 Excavation grid laid out on the pithouse prior to excavation

To my disappointment the three small cuts I made (fig. 5.3) did not reveal a recognizable house pit, as it had no floor, slumped walls, or hearth. Rather, the depression seemed to result from a conical pit that had been excavated into the sandy

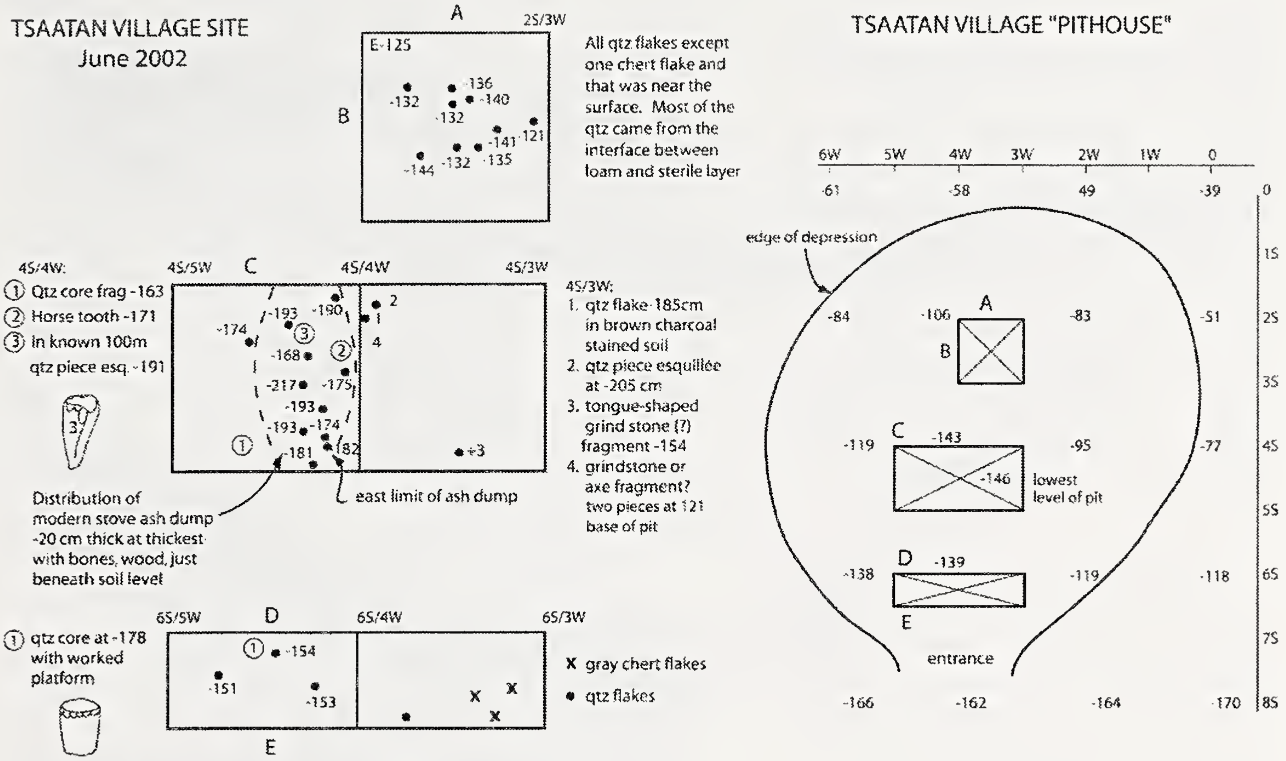
TSAATAN VILLAGE SITE
June 2002
A
2S/3W
E-125
B
-136
-132
-140
-132
-121
-141
-144
-132
-135
All qtz flakes except one chert flake and that was near the surface. Most of the qtz came from the interface between loam and sterile layer
45/4W:
① Qtz core frag -163
② Horse tooth -171
③ In known 100m qtz piece esq. -191
3
4S/5W
C
4S/4W
4S/3W
-193
-190
-174
-168
-217
-175
-193
-193
-174
-181
182
2
1
4
+3
Distribution of modern stove ash dump -20 cm thick at thickest with bones, wood, just beneath soil level
east limit of ash dump
4S/3W:
1. qtz flake 185cm in brown charcoal stained soil
2. qtz piece esquillée at -205 cm
3. tongue-shaped grind stone (?) fragment -154
4. grindstone or axe fragment? two pieces at 121 base of pit
① qtz core at -178 with worked platform
6S/5W
D
6S/4W
6S/3W
① -154
-151
-153
E
X gray chert flakes
● qtz flakes
TSAATAN VILLAGE "PITHOUSE"
6W
5W
4W
3W
2W
1W
0
-61
-58
49
-39
0
1S
2S
3S
4S
5S
6S
7S
8S
edge of depression
-84
-106
A
-83
-51
B
C
-143
-119
-146
-95
-77
lowest level of pit
D
-139
-138
-119
-118
E
entrance
-166
-162
-164
-170

Figure 6.3 Minge Polog Pithouse excation units

and cobble river terrace. Within the pit I found three stratigraphic levels, roughly following the outline of the pit walls, each about 25 cm thick in the center and lensing out at the surface: Level 1, cobble-free homogeneous brown soil; Level II, mottled brown sandy loam with many cobbles, the majority of the lithic industry, and scattered charcoal; and Level III, a mixed sandy gravel with clay pockets and no charcoal. A radiocarbon age of 1300±70 BP (2-sig. calib. A.D. 630-890) was produced on a composite sample of charcoal scattered in Level II. Throughout these levels we found a handful of quartz and quartzite flakes, several quartz pièces esquillées (scaled bi-polar cores), a small quartz core, a possible coarse grindstone or axe blank, and in the upper strata just beneath the turf, a single black chert flake. Near the center of the depression, 25 cm below the sod and about the same distance above the base of the cultural deposit, we found a well-preserved horse tooth, and just beneath the sod, a modern ash lens with burned bones and pieces of wood. The Tsaatan told us that a Soviet-style reindeer brigade and a mining survey team had occupied this terrace in the middle of the 20th century; this may account for the recent ash and bone refuse deposit. This deposit was not associated with the lower levels of the pit, whose L2 seems to have been used in the 1st millenium AD. An earlier

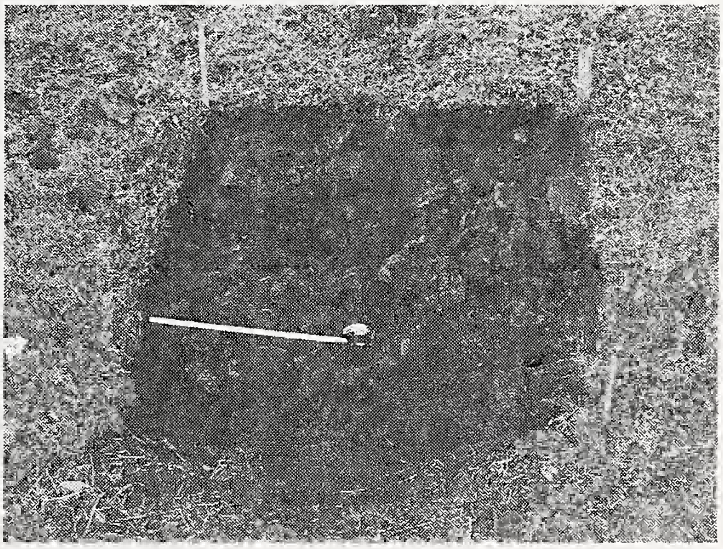

Figure 6.4 Unit A

occupation, containing the bipolar quartz technology, was mostly associated with L3. It is not clear if the black chert horizon is related to the quartz industry, but no black chert flakes were found in the pit fill. Rather they occurred in the surface sod at the lower end of the feature, and therefore seem to represent a separate, later component. Further excavation might clarify the lack of artifacts and cultural definition of the three layers, and the confusion as to whether this feature is a pit or a pithouse.

During our 2002 visit we surveyed several kilometers west along the Minge Polog stream from the Tsaatan camp, but the only sites noted were 20th century summer Tsaatan reindeer camps. These surveys were very brief and did not include subsurface testing. Further surveys are planned for 2003. Before its use as a reindeer herding territory this valley must have been a good area for hunting wild reindeer in the summer season.

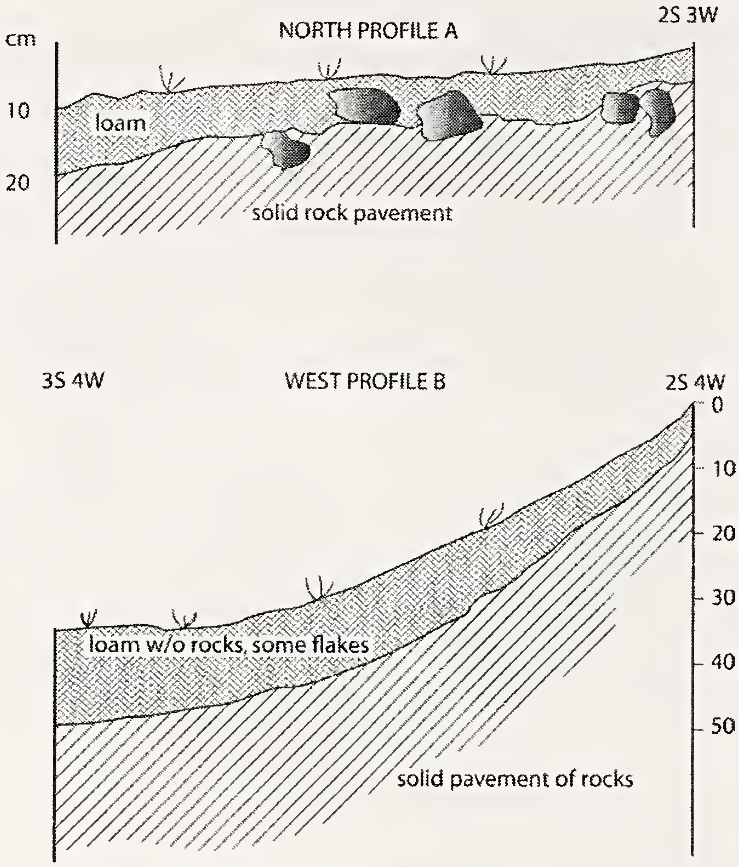

Figure 6.6 *Pithouse excavation units A and B profiles*

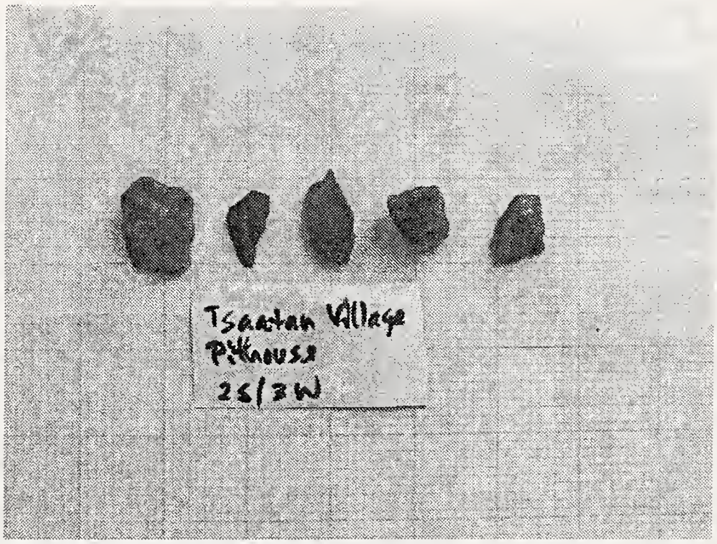

Figure 6.5 *Pithouse excavation artifacts*

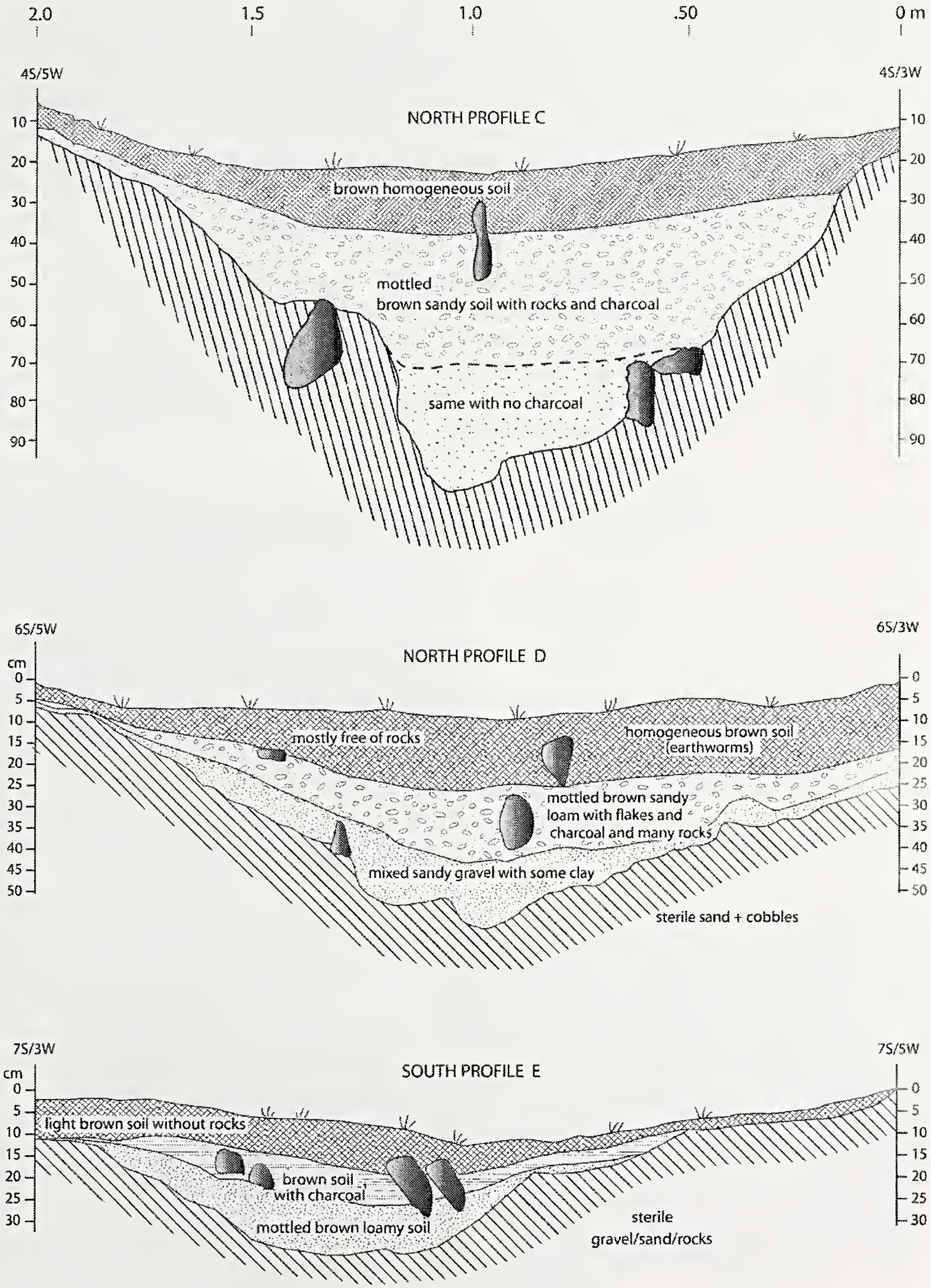

Figure 6.7 *Pithouse excavation units C, D and E profiles*

The Soyö Neolithic Site

While staging our excursion into the mountains, we found a Neolithic site (Sta. 92) on the south bank of the Khugiin-gol at Soyö. The site is located on a grassy terrace about 9m above the river and immediately below the prominent conical landmark known as Soya Hill and is situated at the location where the river exits the mountain forest and emerges onto the Darkhat plain. This site is the obvious place for a camp in this portion of the valley and probably has been used for many thousands of years.

We did not have time to test the Soyö site, but collected charcoal and bone samples from two hearths exposed at the terrace edge. The charcoal was present in large quantities, and some appeared only partially carbonized. The hearths also contained bone and fire-cracked rock and slabs and were part of a 15cm thick charcoal-stained buried soil horizon exposed by the erosion of the terrace front. Among the bones were large herbivore (deer or elk), small mammals, and a scapula of a sheep or goat. We collected a few artifacts on the terrace face below the buried soil and hearth level; these include a small conical prismatic flint core, several microblades, and a fragment of coarse, tan-colored ceramic with a red exterior wash or paint. We assumed that these artifacts, dated to the Neolithic period, had eroded from the buried soil and hearth level, which is exposed for a distance of about 100 m., beneath 1-3m of windblown sand derived from the eroding terrace front. A modern garbage pit about 1 meter square cut into the terrace about 10m west of Hearth 1 and 7m in from the terrace edge showed the same cultural level buried beneath about 50cm of wind-blown sand. Our Mongolian colleagues said this was the first Neolithic site known from the Hovsgol region, but it seems that John Olson's Russian-American-Mongolian survey team found a Neolithic site east of Hovsgol during the 2003 season.

Based on the Neolithic artifacts we expected the hearth charcoal to date ca. 5-6000 years ago. We were surprised therefore to receive ages for Hearth 1 of 1170±50 B.P. (calib. 2-sig. A.D. 720-740, 760-990) and Heath 2 of 1020±50 B.P. (calib. 2-sig. A.D. 910-920, 960-1060, 1080-1150). The consistency of these dates suggests that they do indeed date the cultural zone found in the dark-stained buried soil horizon, and help explain the presence of unburned wood within

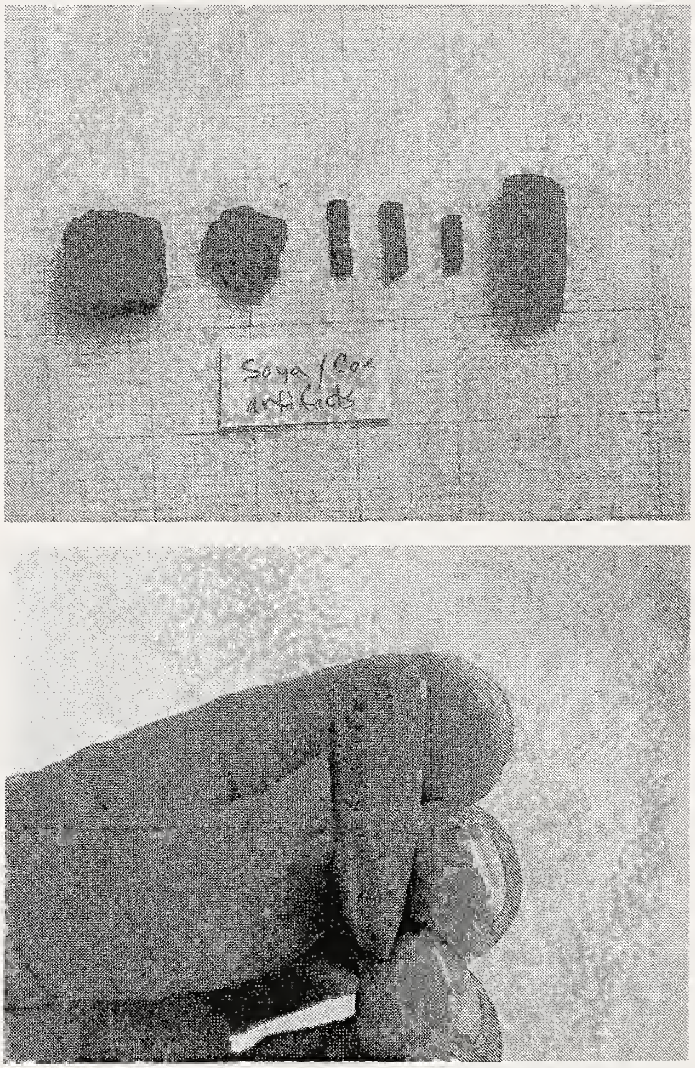

Figure 6.8 *Soya site Neolithic ceramic sherd, microblades and microblade core (top); closeup of microblade core (bottom)*

some of the charcoal samples (probably Siberian larch) and the extremely well-preserved bone remains. Although we did not notice a second cultural level in the bank exposure, these dates suggest that the Neolithic materials must originate either from the base of the upper buried soil or from a deeper level that we did not notice (this supposition was confirmed by excavations conducted in June, 2003-ed).

If sufficient material can be isolated, the Soyö site holds promise for studies of two different periods: Neolithic and Late Iron Age / Early Medieval. It will be important to identify the nature, relationships, and subsistence economy of both components. The presence in the later horizon of both forest game and domestic sheep or goats provides an interesting starting point for investigating local subsistence practices. Hopefully, reindeer remains will also be found here and with the Neolithic level. An important environmental feature of the site is the presence of a buried timber horizon that outcrops for a considerable distance along the south bank of the river. Although not yet identified as to species, a sample of this wood has been dated to 6090±70 BP (2-sig. calib. 5230-4800 B.C.) The composition of this buried forest may shed light on the local environment of this period, and it will be interesting to see if its presence is related to the adjacent dwelling site, or contains cuts or axe marks. Of related interest in the question of the dating of the former lake levels whose shorelines are clearly cut into the hills bordering the Darkhat Valley, and whether the 9 m. elevation of the Soyö site can be related to Darkhat level levels. It will be important to determine the relationship between the site, the river, and the lake level and shoreline location.

Erkhel Lake Site Complex

Eight km west of Lake Erkhel, which is about 30 km north of Muron, is a large ceremonial complex containing scores of boulder mounds and kheretsur. Located on the southeast side of a prominent hill known as Ulaan Tolgoi, which rises in the center of the valley floor, is a cluster of stone mounds and several ornamented deer stones that are among the finest in Hovsgol aimag, one of which may be the largest and most beautifully-carved monuments in Mongolia. This stone is a beautiful slab of granite standing almost 4m above ground, the second from the southern end of a north-south alignment of five other slabs having different shapes and degrees of decoration. The deer stone art has been recorded in drawings made by T. Sanjmiatov, and more recently Gary Tepfer photographed several of the stones when he and Esther Jacobson visited the site. Sanjmiatov, who had worked at this site as part of a Soviet-led team many years ago, remarked that they had re-set at least one of the monuments that had been found toppled, and we were able to identify this stone (the southernmost) by its concrete setting. Our team spent a few hours here in 2001 and returned in 2002 to map one of the smaller deer stone settings. During the 2002 visit I explored the surrounding land and found the valley floor packed with mounds and kheretsurs that extended up the slopes into the rocks above. Clearly the

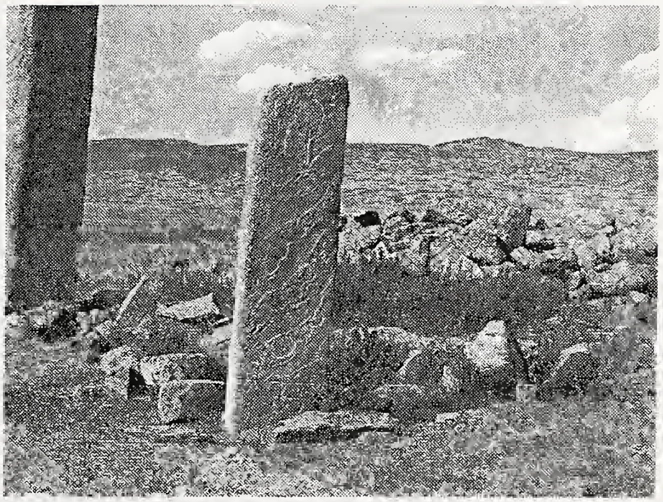

Figure 6.9 *Erkhel Lake deer stones # 1,2 (left)*

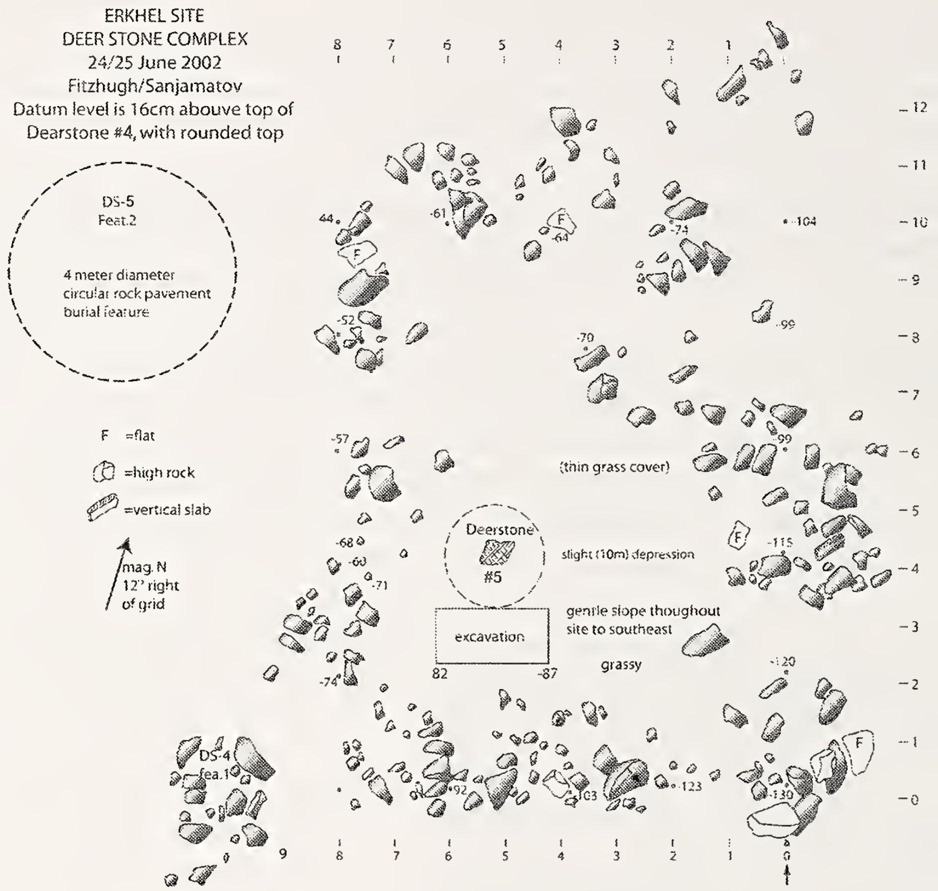

Figure 6.10 Erkhel Lake site plan

Erkhel region was an important area, with Ulaan Tolgoi having special significance. During the day we spent here we completed a map of Deer Stone 5 and its associated stone setting, excavated a 1x2m trench adjacent to the stone, and part of one of the oval 'altar' features 50m east of the deer stone.

The purpose of the trench was to see if the stone's age could be determined directly by dating organic artifacts, bones, or charcoal found either in the pit associated with the stone's original setting or in ritual fires, deposits, or other activities that could be inferred as having taken place at the time the stone was dedicated. While determining the association of anything other than the original pit could be problematic due to the possibility of later ritual activity, we might at least determine the earliest dates associated with a particular deer stone, and eventually come closer to a true age for these monuments and their deer stone art, which Jacobson has suggested may be ancestral to Scythian art.

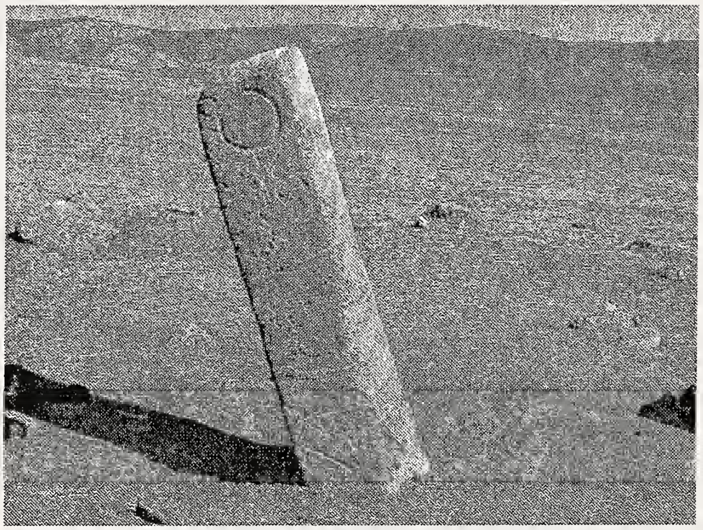

Figure 6.11 Erkhel Lake Deer Stone No. 5

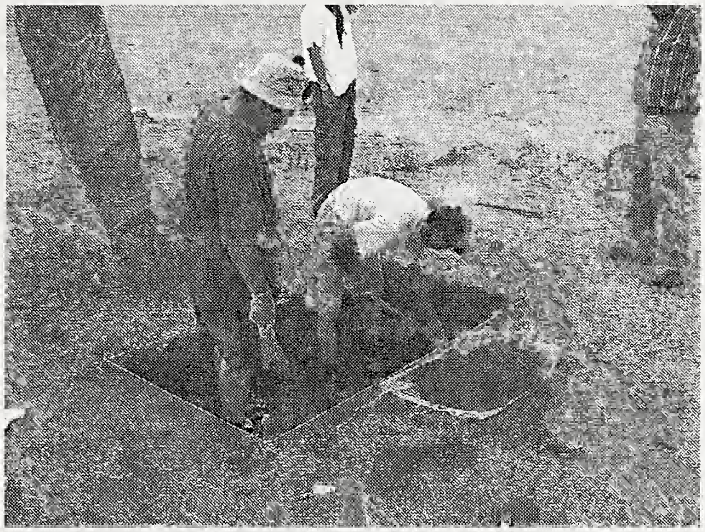

Figure 6.12 *Erkhel Lake Deer Stone No. 5 excavation trench*

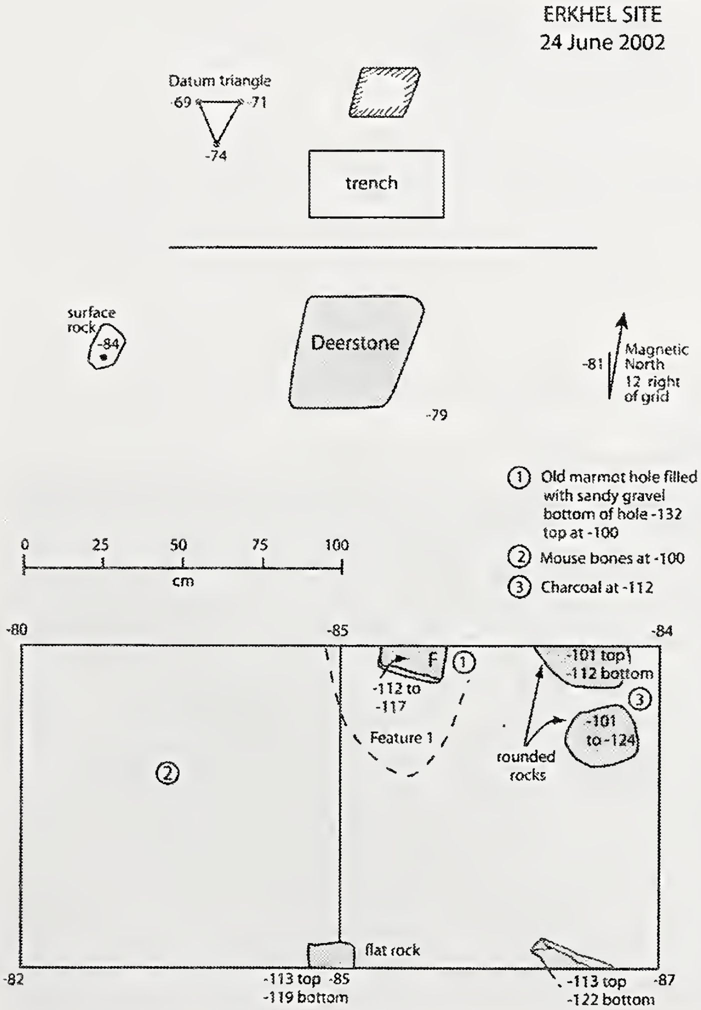

Figure 6.13 *Erkhel Lake Deer Stone No. 5 excavation plan*

Our small trench was laid out in E-W orientation with the center of its north wall 75cm south of the stone to avoid undermining its foundation. DS5 appeared to be in its original position. The excavation, which terminated 40cm below ground surface, failed to reveal evidence of a pit associated with the original setting of the stone. Beneath a 1-2cm thick turf zone we found four stratigraphic levels. From the uppermost to the deepest they include: Level I, being a 4cm thick layer of loosely-packed gravelly sand that appeared to have accreted as wind-blown deposits and contained no cultural material; Level II, a 5cm thick buried old ground surface containing organic stains but no cultural material; Level III, a 20cm thick layer of gravel-free light brown silt-sand; and Level IV, a dark-stained zone reminiscent of an old ground surface which contained fragments of charcoal. Two small charcoal samples suitable for AMS dating were collected in this zone directly beneath a 25cm diameter cobble, in undisturbed context and yielded a date of 2090±40 BP (2-sig. calib. 200 B.C. to A. D. 10). Immediately adjacent to the deer stone and clearly defined in the north wall of the trench was a rodent burrow (probably marmot) that terminated at the top of a flat slab 35cm below the ground surface, 50 cm north of the rock and charcoal find. We recovered a few recent mouse bones from the center of this disturbance. Beneath this level was sterile undisturbed gravelly sand with small rocks whose undersides were encrusted with white mineral salts, indicating in situ undisturbed soil. The rock and 5cm thick slab, lying flat and in the middle of the L-IV horizon were clearly culturally-placed and probably were associated with the erection of DS4. However since we were unable to note any stratigraphic evidence of a soil cut associated with the monument, I presume that the

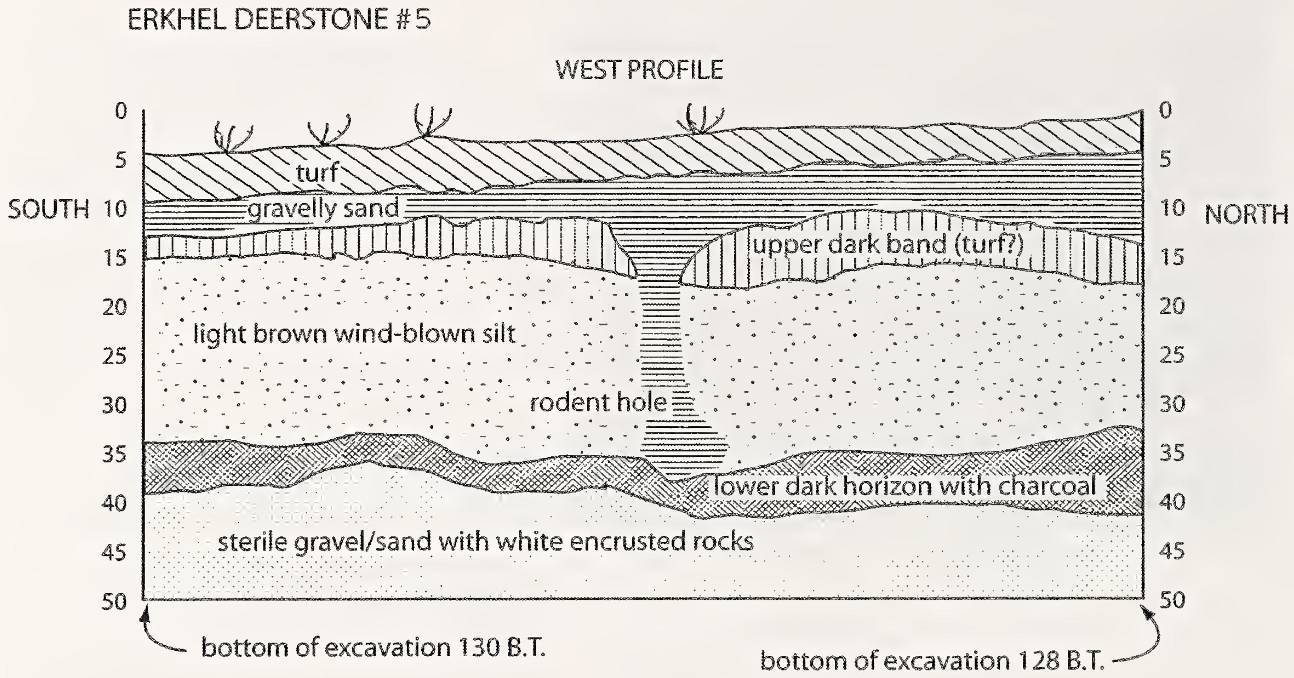
ERKHEL DEERSTONE #5
WEST PROFILE
SOUTH
NORTH
0
5
10
15
20
25
30
35
40
45
50
turf
gravelly sand
upper dark band (turf?)
light brown wind-blown silt
rodent hole
lower dark horizon with charcoal
sterile gravel/sand with white encrusted rocks
bottom of excavation 130 B.T.
bottom of excavation 128 B.T.

Figure 6.14 *Erkhel Lake Deer Stone No. 5 excavation west profile*

slabs were part of the original site surface at the time of the stone's erection and that the stone was set into a very narrow pit, only large enough for the stone's base, that had not extended into our excavation area. Given the cemented nature of the subsoil, use of a deep narrow pit would provide the most solid foundation. No artifacts, bones, or other cultural materials were found in the trench.

We also tested a single oval ring feature (F3) that consisted of a loose oval rock arrangement with its long axis oriented N-S and internal dimensions of 1 x 0.75m, located 47.5m and 100 degrees (mag.) From DS5. This feature seemed identical in appearance to the small oval features found around the outside of kheretsur structures, or associated, as in our present case, with a deer stone setting. The feature rocks had been chosen for their large blocky size and were placed in a oval ring around a cleared center. We excavated a 1 x 0.50m trench inside the rock ring, finding two soil levels: Level I being unconsolidated wind-blown sand, and Level II being a tan sandy soil 20-30cm thick containing charcoal stains and calcined bone fragments. These fragments were robust and are probably from a single large animal, perhaps a horse, although positive identification

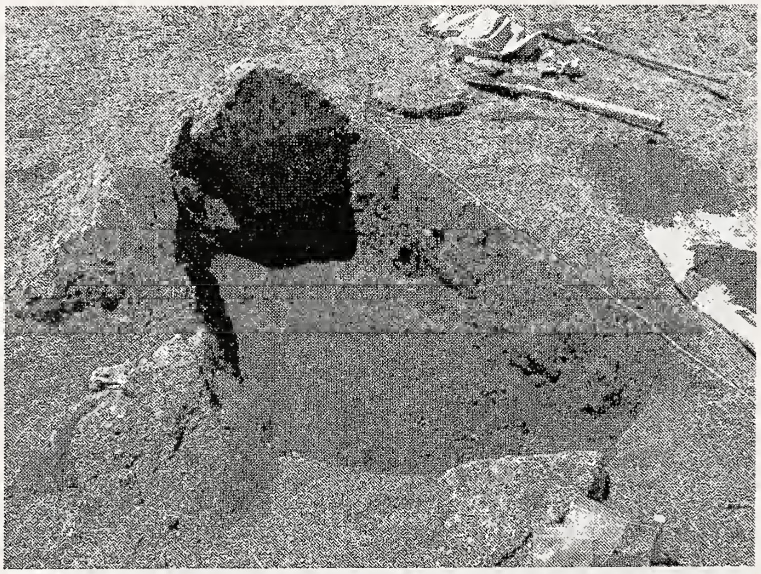

Figure 6.15 *Erkhel lake altar feature excavation, view SW*

was not possible from the fragments we recovered. More work needs to be done here as the cultural deposit extended beyond our trench under the east wall rocks. A small AMS sized charcoal sample was obtained but has not yet been dated. In the future we plan to excavate and date a number of these features and other parts of these ceremonial complexes to determine their function, ritual, and species associations; their chronological relationships within individual deer stone settings and kheretsur; whether the structures result from ceremonial events at a single point in time or take form over time with the addition to new altars or other features. Since many of the mounds in the Erkhel complex are so large, mapping, sampling, and investigation of the outlying features is a practical way to begin their investigation.

At this point I cannot offer any sweeping generalizations about our work at Erkhel, nor can I argue with great assurance that the charcoal date of 200BC to AD 10 makes sense for the dating of DS5, as it could be argued that this sample might have been contaminated by organic residue from the nearby rodent burrow. However, it is a start in an attempt to provide chronometric dating for these monuments that have heretofore been dated largely by stylistic means. Hopefully future work will provide more data

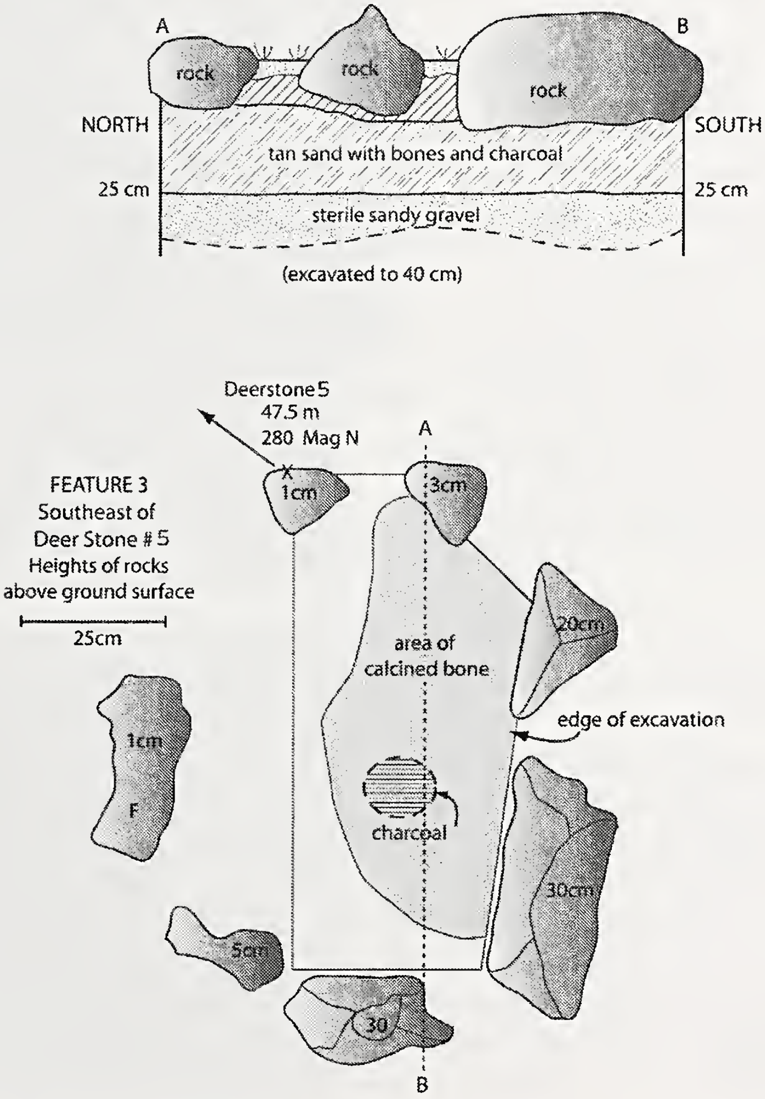

Figure 6.16 *Erkhel Lake Feature No. 3. North at top.*

for studying the Erkhel site in terms of its ritual landscapes, functional and stylistic differences in stone constructions, construction histories of discrete kheretsur and mound features, studies of ring features and their relationship to central constructions, feature and stone setting dates, and other aspects of this fascinating site.

A Looted Kheretsur

While surveying on the southwest flank of Ulaan Tolgoi, we found a kheretsur (Sta. 119) whose central boulder mound (10m diameter, 1 meter high) had been recently opened by looters, whose food remains and candy wrappers still lay in place around their lunch fire north of the mound. A human skull and a few other human bones were found lying in the bottom of the looted pit about one meter below the ground surface. We collected the skull, some vertebrae, and some long bones, and sifted through the disturbed soil in the open pit, recovering a small bag of animal bones, most of which were marmot and mouse, but some appeared to be goat or sheep. These materials have not yet been analyzed, but we did not see any horse-sized materials. We reported the vandalism of the site to the Governor's office in Muron and to officials at the National Museum of Mongolian History. Both acknowledged a rising trend in archaeological vandalism.

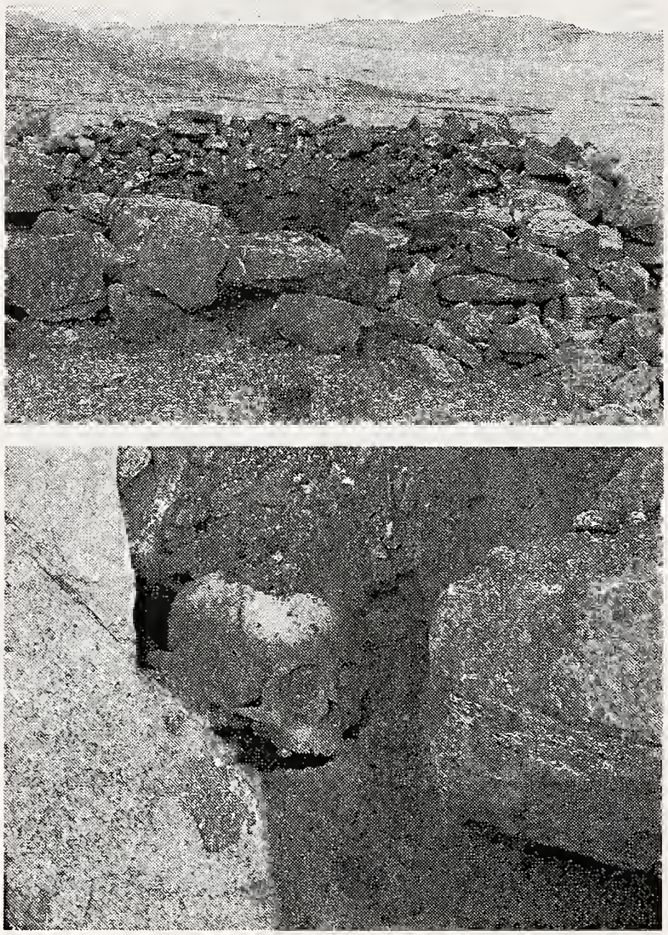

Figure 6.17 *Looted kheretsur near Ulaan Tolgoi (top); and its human remains which were discarded by the looters (bottom)*

Erkhel Granite Quarry

On the north face of the hill rising from the south shore of Erkhel Lake we found high-quality granite outcrops which had been quarried in recent decades for architectural building stone. Modern extraction was by the plug-and-feather technique, and in one instance a single huge rectangular block of granite 15m long and 3m high had been cleanly split out. We did not see direct evidence of prehistoric quarrying but did note many naturally-occurring blocks which had widths similar to those used for making deer stones. Many of these blocks had fused red-colored cleavages like those we had seen on some of the deer stones. The rinds of these iron-stained cleavage faces was 0.5-1.0cm thick, similar to those noted on deer stones. We believe that the red-stained rinds on the deer stones may have a geological origin and that these naturally-stained faces may have been selected because of the contrast they provided when carvers worked through the stained level into the unstained granite beneath it. This quarry is a likely source for the Erkhel deer stones.

A Paleolithic Core?

We found an interesting rock at Sta. 121 in the detritus surrounding a patch of marmot holes on the valley floor about one km southeast of the Erkhel monument site. The specimen had the appearance of a discoidal core heavily encrusted in travertine or salt deposits. No other possible cultural materials were noted. There may be an old buried site here, from a time when Erkhel Lake was much larger than today.

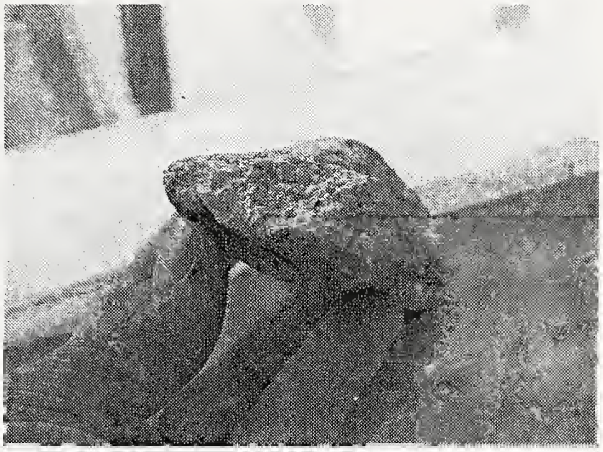

Figure 6.18 *Possible Paleolithic core*

The Baga Ertseg Shaman's Cache

An unusual find was made at Sta. 109 on a prominent hilltop in the highlands between Muron and the Darkhat Valley. While camped here we found a shaman's cache in the cleft of the rocks at the summit of the hill. The location is dramatic, with rock pinnacles emerging from the crest of the hill, a cave-like wooded forest glen between the pinnacle outcrops, and a view for miles around over the surrounding hills and valleys; passing nearby, we had found ourselves drawn irresistibly to the hill crest, sensing in it a place of power. Judging by the condition of material, the cache had been brought here perhaps a decade or more ago in a small wooden packing crate which lay opened a few meters downslope from the pinnacle outcrop on the west summit of the hill. A shaman's drum and drum-beater lay at the base of the south-facing side of the hilltop pinnacle, in front of a cleft in which we found a cache of shamanic paraphernalia including a small bronze libation cup, several mouth harps, a tin cut-out depicting a shaman with a feather headdress, and other implements. Respecting the devotional nature of the deposit (which we imagined had been placed here upon the owner's death; or upon a shaman's conversion), we photographed the collection and left the offerings in their original find location places. The drum was almost identical to the one Shaman Suyan had demonstrated to us in her tent in the tundra 2001. Many of the pieces resembled items I once found in a shaman's cache in Yamal, thousands of miles to the northwest, which contained a similar metal cut-out figure of a shaman. Long distance similarities indeed, but ones that give pause when thinking about the spread of religious ideas like those represented at the old Ipiutak burial site in Alaska.

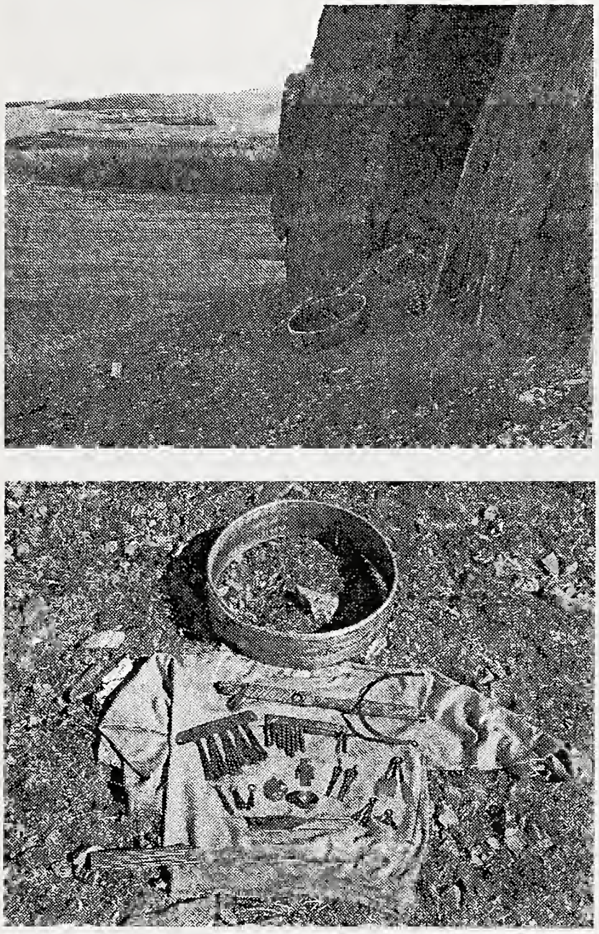

Figure 6.19 *Baga Ertseg Shaman's Cache including a drum frame, rattles, bronze cup and other implements*

Conclusion

The work reported here is the exploratory stage of a longer-term project that we hope to undertake during the next several years, to investigate the history and dating of the cultures of the Hovsgol region, examining its settlement patterns and adaptations so that they can then be compared with better-known regions like Egyin Gol (Crubezy et al. 1996; Honeychurch n.d.) east of Hovsgol and the Tuva taiga and Baikal region of southern Siberia. A primary goal of this research will be to determine how the steppe-taiga boundary influenced cultural development and animal domestication in their respective zones and how cultural and ecological boundaries have shifted in response to changing climate.

A second archaeological goal is to begin a study of Mongolian Bronze and Iron Age cultural and ritual landscapes (Askarov et al. 1992; Bokovenko 1994; Sementsov et al. 1998; Mon-Sol Project 1999/2000; Jacobson et al. 2001, 2002; National Museum of Korea 2002). The principal target for this work will be investigation of the Erkhel Lake site. Our research will apply GPS mapping, modern recovery techniques, and anthropological perspectives to describe and interpret this site and its structures and features. Major questions to be resolved include the radiocarbon dating of deer stone art styles, the function and relationships between burial mounds, *khereksur*, deer stones, and ritual altars, most of which contain cremated (datable) animal remains. These studies hopefully will contribute to better understanding of Bronze and Early Iron Age world-view and ritual landscapes, as well as the social and religious function of deer stones and their role in the religious life of their times.

A third goal will be to begin to assess Mongolia's role in the origins of Scythian art and the hypothesis advanced by Jacobson (1993) (and others) that the elaborate 'Mongolian style' deer stone art is an early form of Scytho-Siberian animal art. I would also like to explore Schuster's hypothesis of a Scytho-Siberian connection with Eskimo art by exploring possible transmission of Central Asian ideas through the Mongolian Bronze and Iron Age and its eastern neighbors. Hopefully this and related studies in East Asia will confirm why Siberia has so far failed to produce materials related to ancient Eskimo art, and why the latter's death masks, ivory ornaments, shamanistic elements, and animal motifs seem more closely related to Mongolian and East Asian.

A final caveat should be noted. Considering that *The Deer Stone Project* has a broad and diverse research plan ranging from geology and climatology to archaeology, ethnology, and natural history. We do not presume to be able to make rapid progress on all fronts, or resolve all of the questions raised in this preliminary report. Nevertheless, the work accomplished in the brief expeditions during the past two years, and the encouragement we have received from Mongolian colleagues, from the Tsaatan, and from American colleagues and contributors, encourages us to proceed, confident that we will learn many useful things and will make many new friends in the process.

Acknowledgments

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I also wish to acknowledge the untimely passing of Dr. Adiya Tsend, Second Minister of the Mongolian Embassy in Washington, D.C. in 2003. Dr. Adiya assisted us with the Smithsonian venue of the *Modern Mongolia* exhibition and encouraged our Mongolian research. This report is dedicated to his memory.

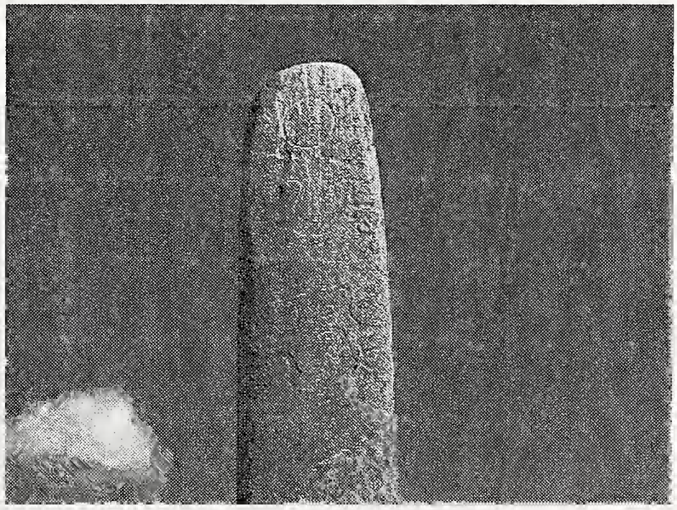

Figure 6.20 *Large deer stone at Erkhel Lake*

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APPENDIX I

Project GPS Log 2001, 2002

All elevations uncalibrated/uncorrected:

2001 GPS Readings

Station 1	Ravine camp northwest of Erkhel Lake site, 25 June 2001 N 49-58.828', E. 99-38.556'
Station 2	Pingo landform in ravine NW of EL site, 25 June 2001 N49-58.330', E 99-39.181' 5848 ft
Station 3	Kheretsur in ravine/canyon north of camp, 25 June 2001 N 49-59.125', E 99-38.533'; elev. 6084 ft
Station 4	Ford at clear-water river, with huge boulder mounds, 26 June N 50-18.764', E 99-19.337' 4951 ft
Station 5	Lunch place with large flood plain, former aimag meeting place N 50-22.820', E 99-19.118'; elev. 6171 ft
Station 6	Crest of high pass with 13 omos, wild-flower collecting; 158 km from Muron, and the only road through these hills to Darkhat V., route taken by Genghis Khan's son when he expanded the empire into Siberia N 50-34.661', E 99-08.599'; elev. 7004 ft
Station 7	Rinchinlhumbe village, south end Darkhat V. [or is this Ulan Uul = 'Red Mountain', district center?] N 51-22.997', E 99-19.315' 6202 ft
Station 8	Two large stone mounds on SW side of Darkhat V. N 50-37.120', E 99-10.485'; elev. 5285 ft
Station 9	Possible arch. site on hillside at edge of valley (blowouts or beach lines?) N 50-59.854' E 99-10.736'; elev. 5321 ft
Station 10	Khugin-gol ('Melody') River (Soya) campsite, 27 June N 50-59.853', E 99-10.738'; elev. 5304 ft

Station 11	Khugin-gol Soya site N 50-59.853', E 99-10.738'; elev. 5301 ft
Station 12	Khugin-gol Soya site N 50-59.855', E 99-10.739'; elev. 5411 ft
Station 13	Rest stop on horse trek into mountains, river terrace with large larch trees N 51-01.539', E 99-02.600'; elev. 5827 ft
Station 14	Evening camp on north side of river across from highest winter sheep pasture N 51-05.621', E 98.58.484', elev. 6346 ft
Station 15	West side just below crest of pass entering Tsaatan summer pasture, 28 June N 51-05.543', E 98-58.452'; elev, ca. 7836 ft
Station 16	Tsaatan camp locale called Minge Poluk, in summer tundra pasture, 28 June N 51-11.402', E 98-54.976'; elev. 7236 ft
Station 17	Archaeological 'pithouse' in middle of Tsaatan camp, with flake of black chert, 29 June N 51-11.451', E 98-54.972'; elev. 7281 ft
Station 18	Tsaagan-nur ('white lake') village, 1 July N 51-21.267', E 99-21.010'; 5103 ft
Station 19	Pingo? or archaeological site? (viewed only from the jeep) N 51-18.270', E 99-18.994'; elev. 5129 ft
Station 20	"Sixty Years" spelled out in boulders along terrace below road N 51-18.235', E 99-18.877'; elev. 5108 ft
Station 21	Two mounds at rocky headland along road north side Tsaagan nur valley, with lots of small cairns along north side of road N 51-02.055', E 99-15.797'; elev. 5227 ft
Station 22	Evening camp on hilltop overlooking river ford, 1 July N 50-48.485', E 99-16.093'; elev. 5476 ft
Station 23	The river ford where we were pulled across by tractor owned by Batmonkh. 2 July N 50-47.774', E 99-16.567'; elev. 5254 ft
Station 24	Another mound site in canyon pass camp area, a small boulder mound without enclosure, east of a main, large mound with square enclosure and corner structures. 2 July N 49-58.119', E 99-39.406'; elev. 5949 ft

Station 25	200 m to east at same site, down-valley from #24: a rock ring feature 5x8m. 2 July N 49-58.032', E 99-39.474'; elev. 5953 ft
Station 26	Ushkin Uul Uver deer stone site, south of 'lung mountain'. 3 July N 49-39.352', E 99-55.647'; elev. 4564 ft
Station 27	Lake Hovsgol, 6 July. Hotgol town, 51 degree mean July temp, colder than Kotzebue, AK, acc Steve Young N 50-40.931', E 100-14.546'; elev. 5428 ft
Station 28	Hilltop above West shore of L. Hovsgol, transition grassland to tundra with addition of dwarf birch, cladonia, and other species N 50-45.382', E 100-11.655'; elev. 7500 ft

2002 GPS Readings

Station 89	Ushkin Uver site, deer stone location; casting face stone with Paul Rhymer and Carolyn Thome. 15 June N 49-39.269', E 99-55.653'; elev. 4359 ft
Station 90	Three pingos (two intact, one collapsed) in valley north of first night camp site (2001 lunch site). 16 June N 49-39.269', E 99-55.653'; elev. 4354 ft
Station 91	Baltag River ford. 16 June N 50-47.818', E 99-16.659'; elev 5288ft
Station 92	Khugin-gol ('Melody') River Soya Neolithic archaeological site at camp where met Tsaatan. Sketch in WF pocket notebook. 17 June N 50-59.727', E 99-09.705'; elev. 5312 ft, 1618 m
Station 93	Eroding dune site on sandy ridge on north side of Khugin-gol river noted while treking up into mountains. Charcoal, burned slabs, burned bone. No collections made. Sketch in WF small pocket notebook. 17 June N 50-59.809', E 99-06.296'; elev. 5326 ft
Station 94	Lunch site along east bank of river, during trek, at southeast end of big clearing; surveyed 300 m along eroding river bank and found a few old bones, but not archaeological site. 17 June N 51-01.195', E 99-02.772'; elev. 5692 ft
Station 95	Camp at same spot (sta 14) as 2001, across river from last sheep winter camp. 17 June N 51-05.538', E 98-58.428'; elev. 6342 ft (6346 was 2001 elev.!)

Station 96	N 51-08.273’, E 98-54.935’; elev. 7923ft
Station 97	Our camp on the Minge Polog, east of Tsaatan camp, as in 2001. N 51-11.398', E 98-54.977'; elev. 7251 ft
Station 98	An abandoned Tsaatan summer herding camp west of present village, surveyed briefly during a walk down (west) the river. Many hearth areas, manure piles, and one earth-mounded tent foundation with opening on the east side, with earth-mounded tent ring, mounded 10 cm high and 50 cm wide. N 51-11.888', E 98-54.450'; elev. 7247 ft
Station 99	The pass at the northeast end of Tsaatan mountain valley. 21 July N 51-09.590', E 98-59.978'; elev. 7522 ft
Station 100	Our botanists evening camp of 21 July N 51-08.099', E 99-06.594'; elev. 5815 ft
Station 101	Two upright stone slabs east of three stone burial mounds up against the hill. 21 July. N 50-00.874', E 99-12.173'; elev. 5274 ft
Station 102	Sulfur mineral springs in West Darkhat, on small hill, with several stone mounds. 21 June. N 51-00.881', E 99-20.923'; elev. 5095 ft
Station 103	New Bridge constructed west of our tractor-pulled crossing in 2001. N 50-48.098', E 99-15.635'; elev. 5268 ft
Station 104	“Breakdown hill”, where in 2001 we had to replace blown-out tire. Spectacular view of the mountains to the north. Interesting tundra-like vegetation with Beringian ‘feel’ acc. To Steve Young. 20 June N 50-26.343', E 99-09.433'; elev. 7275 ft
Station 105	New bridge location near the lunch 2001/night camp 2002 sum meeting place. Four large stone mounds, on of which lies directly SE of bridge, aligned with the bridge traffic. East of the ‘three pingo’ valley. 20 June. N 50-28.339', E 99-18.846'; elev. 6158 ft
Station 106	Hilltop ‘mammoth steppe’ locale, with Beringian type vegetation (and patches of larch) according to Steve Young. 20 June N 50-16.859', E 99-29.153'; elev. 6950 ft
Station 107	N 50-10.993’, E 99-32.711’; elev. 6930 ft
Station 108	N 50-08.662’, E 99-38.845’; elev. 7198 ft

Station 109	Shaman's equipment cache location in cleft in rock at summit of a hill east of our road. Campsite for night of 20 June. Sketch of site area and artifacts in WF field notebook. N 50-08.663', E 99-38.832'; elev. 7187 ft
Station 110	Field location where we saw huge numbers of grasshoppers, en route to Erkhel site area. 21 June 50-00.970', E 99-37.679'; elev. 6432 ft
Station 111	Deer stone area of Erkhel site complex. 21 June N 50-00.969', E 99-37.678'; elev. 6421 ft
Station 112	Khurel type Late Bronze Age burial with round-rectangular boulder pavement level with ground surface, at northwest end of granite quarry area on south side of Erkhel Lake. Burial type identified as such by Sanjmiatov. 21 June N 49-54.486', E 99-56.230'; elev. 5217 ft
Station 113	A fine kheretsur with central low stone mound surrounded by square boulder enclosure with upright slabs at each corner, in oval feature, at southwest entry to Erkhel valley, 20 m north of the 'road'. A great site for land-satellite visibility. 21 June N 49-55.422', E 99-47.154'; elev. 5279 ft
Station 114	Kheretsur with a central burial mound and a round enclosure, on the hillslop north of Station 113. Mound is 2-3 m high and appears to be undisturbed, with intact (original) stone construction at its top. 21 June N 49-55.540', E 99.47.225'; elev. 5384 ft
Station 115	Two mounds on the hillslope above #114, one with a round enclosure and one with a square enclosure (the round being the upper-most). 21 June N 49-55.836', E 99-47.203'; elev. 5564 ft
Station 116	The higher of the mounds adjacent to the deer stone complex, having a square enclosure and external 'altar' features on the SE side only. 21 June N 49-55.878', E 99-48.079'; elev. 5320 ft
Station 117	The huge Erkhel burial mound, a roughly square-shaped mound, partially dismantled for stone, but with some of the upper structure intact as seen by the coursed construction. 21 June N 49-55.850', E 99-48.234'; elev. 5289
Station 118	The lowest deer stone area burial mound, SE of deer stones, with a circular enclosure and altar features outside the enclosure. Mound has a depressed central area as though looted or a collapsed grave. 21 June N 49-55.806', E 99-48.339'; elev. 5235 ft

Station 119	Looted kheretsur/burial mound with a circular enclosure on an upper ridge NW of the deer stone complex, near the juncture of the steppe with the bare rocky hillside. Burial mound had been opened by looters several days before our arrival, and a human skull had been left in the excavated pit about 1m below ground surface. Skull was collected by Sanjmiatov for phys. anthr. lab. Animals bones were collected for radiocarbon dating. Many mice and rodent bones may post-date the burial. Sheep scapula, leather, dog (?) fur, and bird bones also found and collected from the looted pit. N 49-55.876', E 99-47.597'; elev. 5521
Station 120	punched by mistake. Disregard
Station 121	Erkhel. Among gravel and rock brought up from marmot burrows here I found a highly-weathered, fist-size discoidal rock that appears to have been flaked in the manner of a Middle/Late Paleolithic discoidal core. No other flakes or potential cultural materials found. Find locale at the precise GPS location. No test excavation made. N 49-55.889', E 99-49.097'; elev. 5246 ft.
Station 129	Gobi Hotel Muron N 49-38.455`, E 100-08.648’; elev. 4311`

Radiocarbon Dates

APPENDIX II

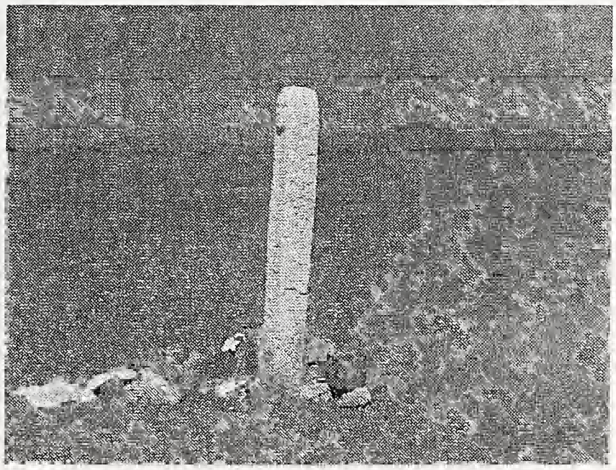
Site	ASC #	Lab No.	Material	BP	Calib AD/BC (2 sig.)
Erkhel DS-4	2002-1	B-169296*	charcoal	2090±40	200 BC to AD10
Baran-gol	2002-1	B-169297	charcoal	1300±70	AD 630 to 890
Soya (paleo)	2002-3	B-169298	wood	6090±70	5230 to 4910 BC
Soya (L1)	2002-5	B-177013	charcoal	1170±50	AD 720-740, 760-990
Soya (L1)	2002-6	B-177014	charcoal	1020±50	AD 910-920, 960-1060, 1080-1150
Erkhel Md	2002-7	B-177015*	Bone collag.	210±40	AD 1500-1670

*AMS date

APPENDIX III
Selected Field Photographs, 2002

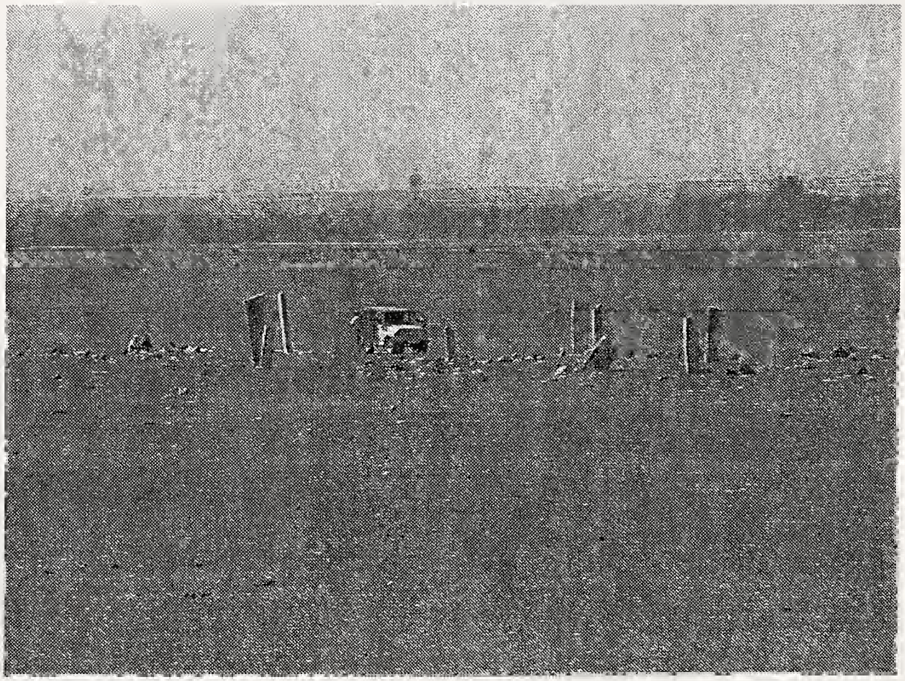
The following images are a selection of William Fitzhugh's digital photographs that do not appear in the text section of this report. All of these photographs were taken with a Sony DSR PD-150 during the 2002 expedition. Dr. Fitzhugh also shot digital video and 35mm slide film. In many cases the 35mm photos duplicate the compositions depicted here and for this reason, as well as time and space limitations, have not been included.

Ushkin Uver deer stone 'belt' motifs

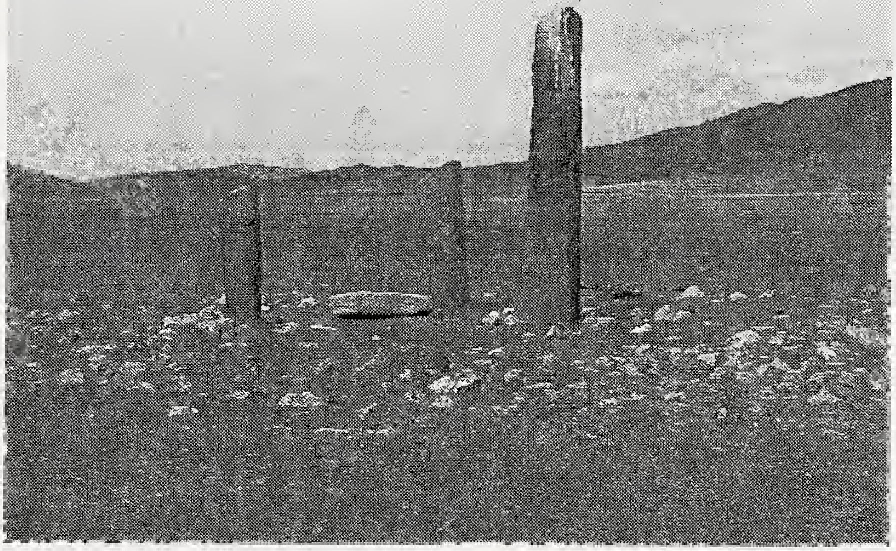


Ushkin Uver deer stone during process of casting by Smithsonian staff

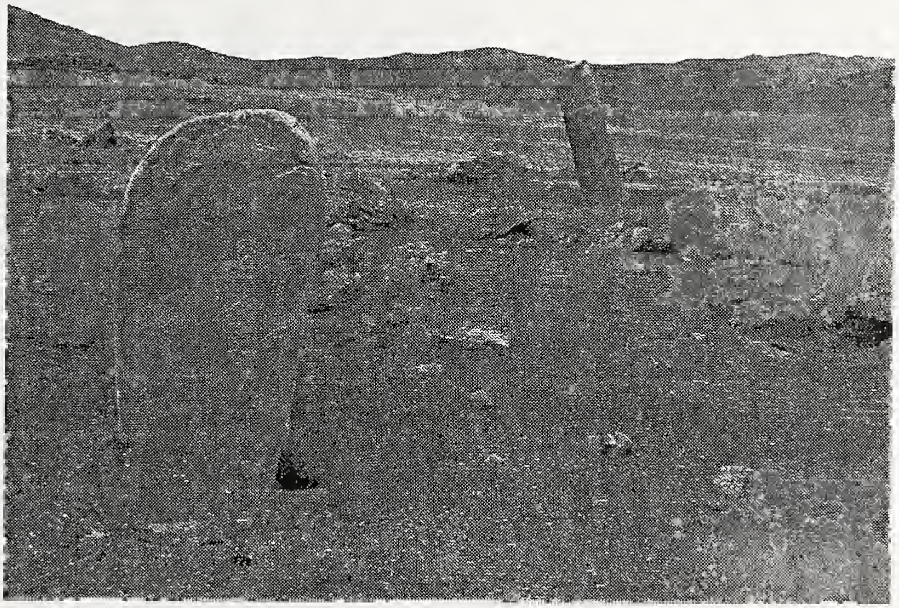
Ushkin Uver site overview to south



Ushkin Uver site overview to west



Deer stone site southwest of Erkhel Lake



Erkhel Lake deer stones 4,5 (right), view north

Sanjiamiatov at Erkhel Lake site, Deer Stone 5

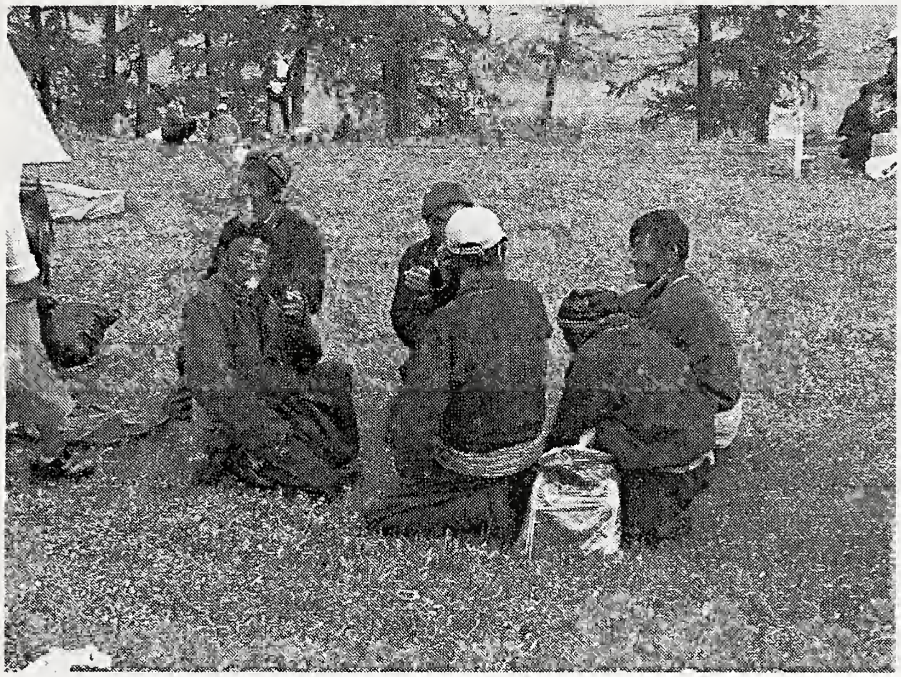
Crew at site near Erkhel Lake

North of Ulaan Uul

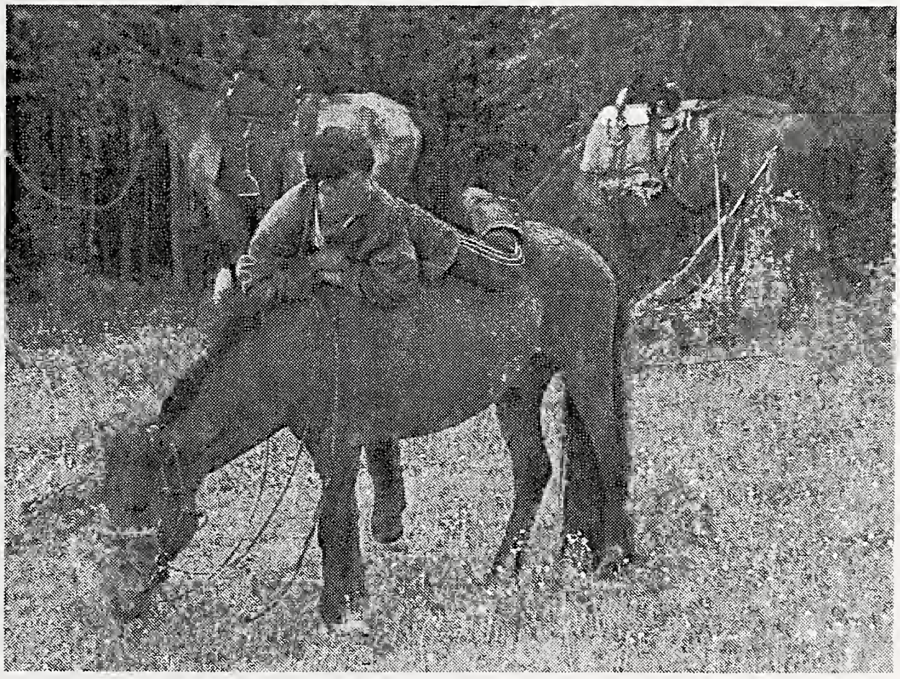
Darkhat Valley view toward Lake Hovsgol Range

Darkhat Valley ford

Soyö military briefing with Tsaatan



Tsaatan at Soyö



Tsaatan man and horse at Soyö

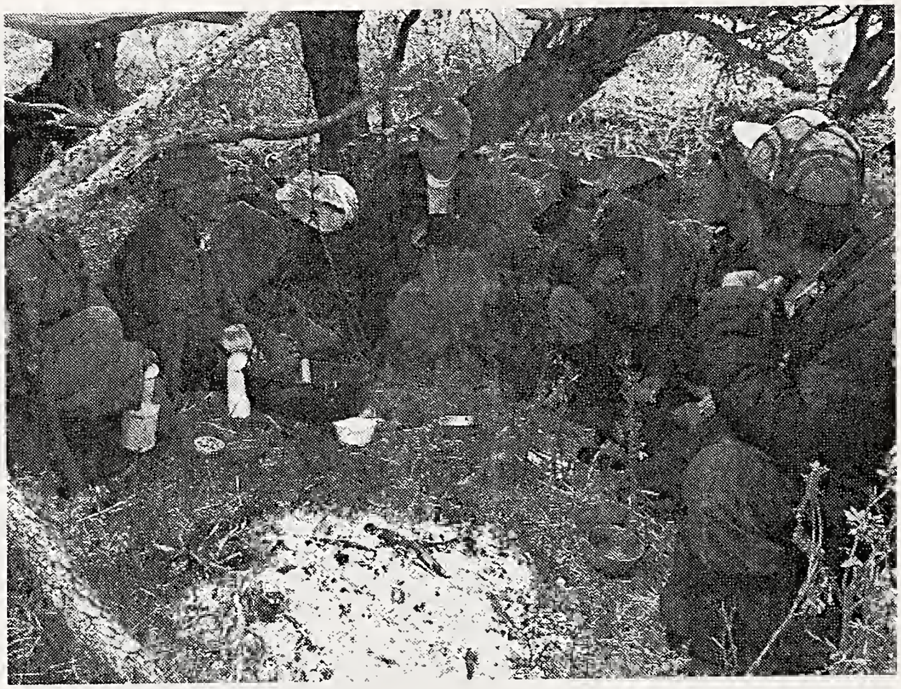
At Soya with Biayandalai, Bayara, Adiyabold

Tsaatan shaman's son, Bayara, at Soyö

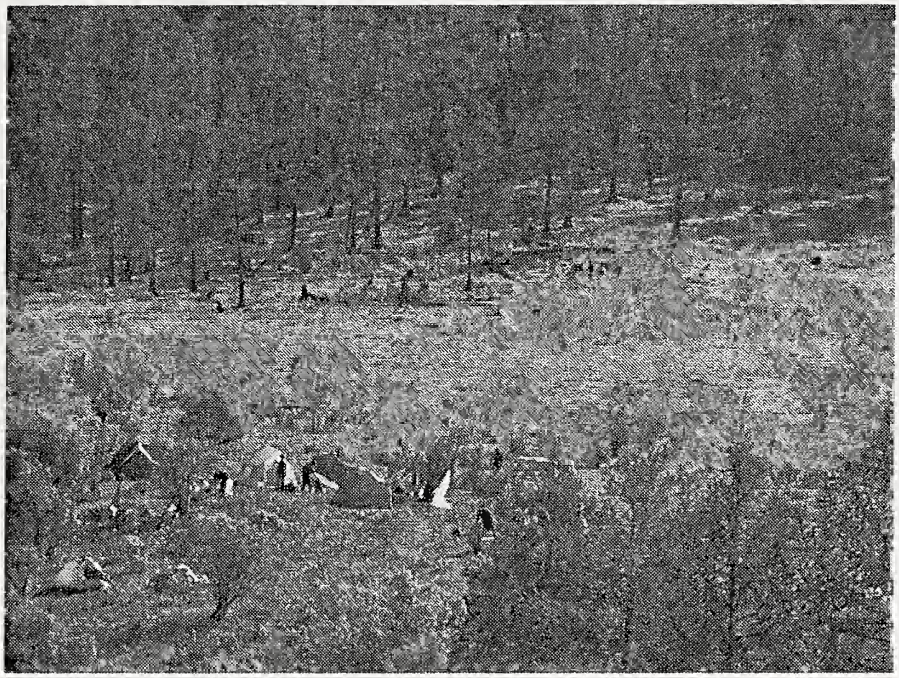
Soyö Neolithic site, view to NW

Paula DePriest and Steven Young prepare to ride at Soyö

Travel camp- Tsaatan shelter- Bayara and Sanjim

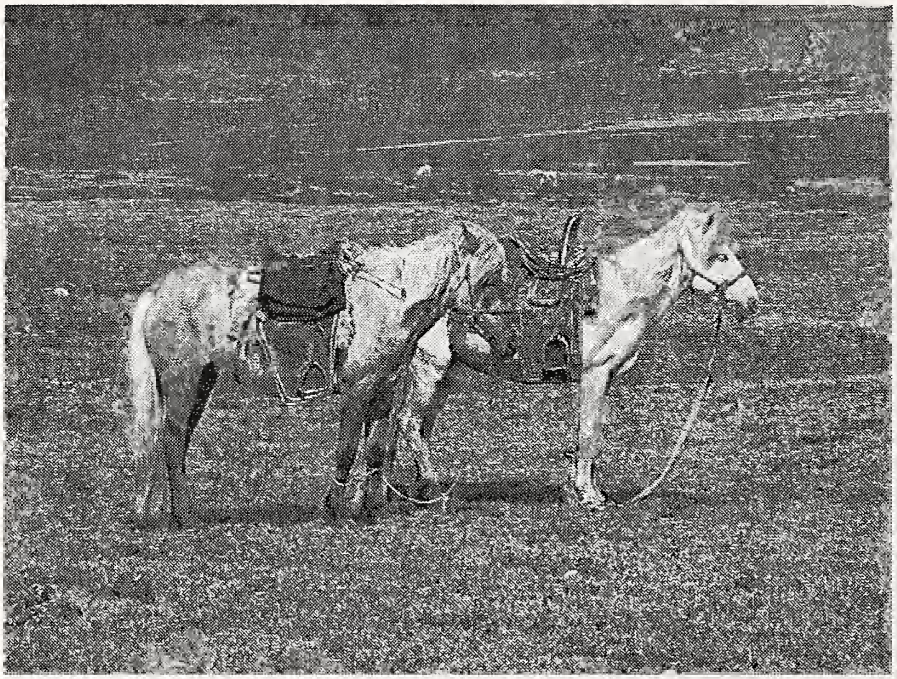


Tsaatan camp en route to tundra



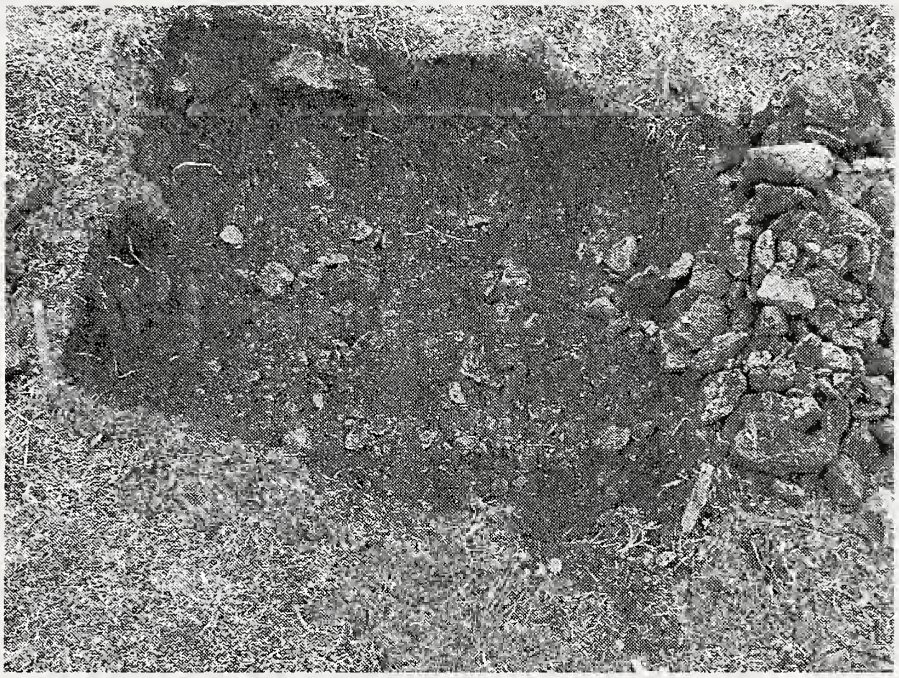
Travel camp

Wildflowers



Tsaatan horses

Mingit Polog pithouse excavation in tundra



Mingit Polog pithouse excavation

Mingit Polog pithouse excavation

Paula and a Tsaatan family

Tsaatan group picture at Mingit Polog summer camp

Tsaatan group

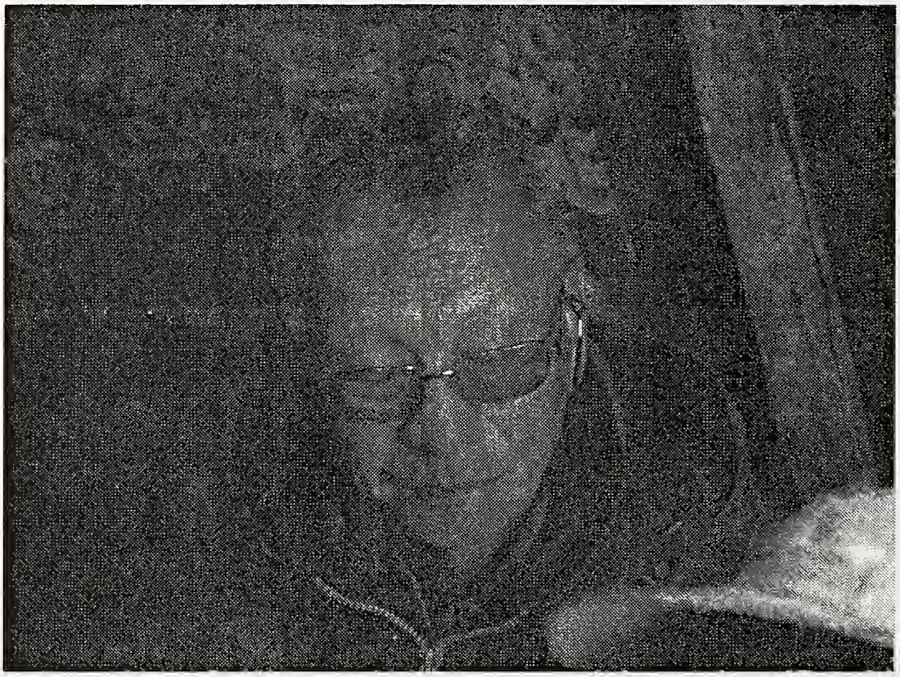
Tsaatan youngster

Blind woman presenting gift to Ed Nef

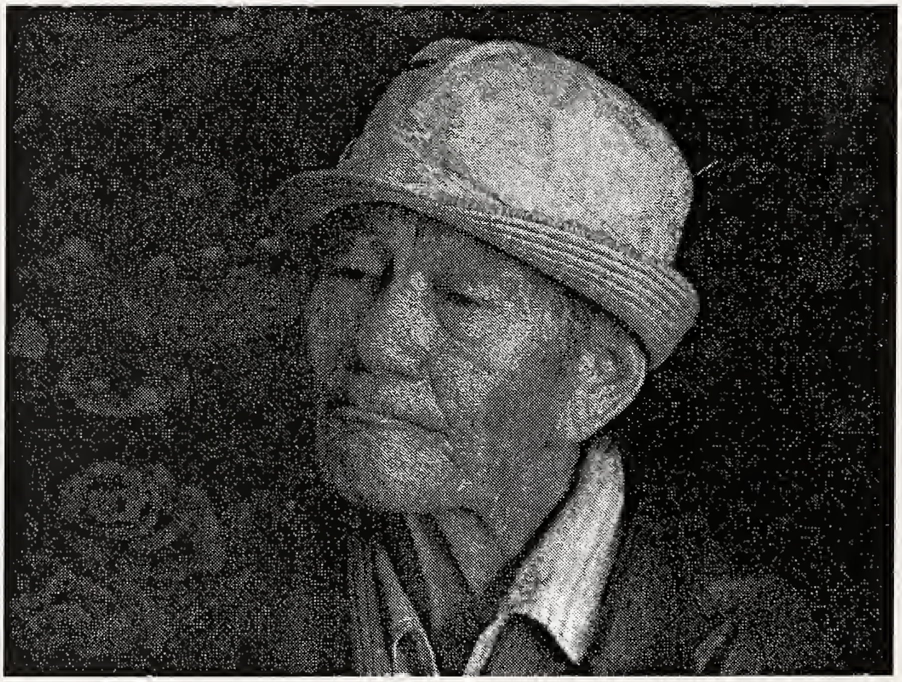
Tsaatan cheer, Tsetsegmaa and Adiyabold

In shaman's tent- her daughter in law

In shaman's tent- her son Bayara



In shaman's tent, Tsendeekhuu

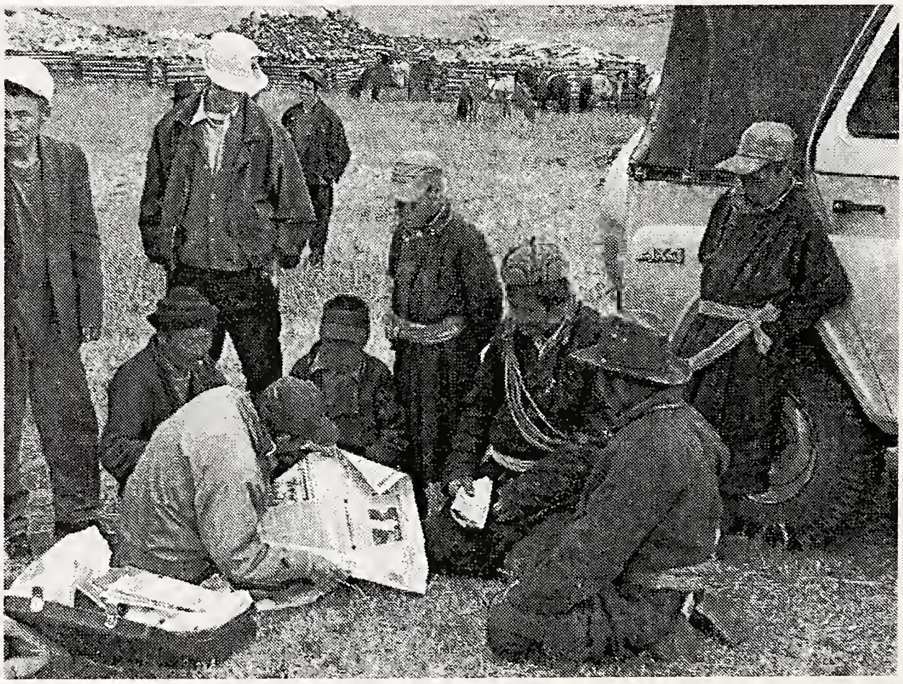


In shaman's tent- Sanjiamiatov

In shaman's tent- Sue Lutz

In shaman's tent- Handaa

In shaman's tent- Sukhbaatar



Sukhbaatar reading the newspaper with Tsaatan

Vandalized Rock art site at Soyö

Soyö rock art site

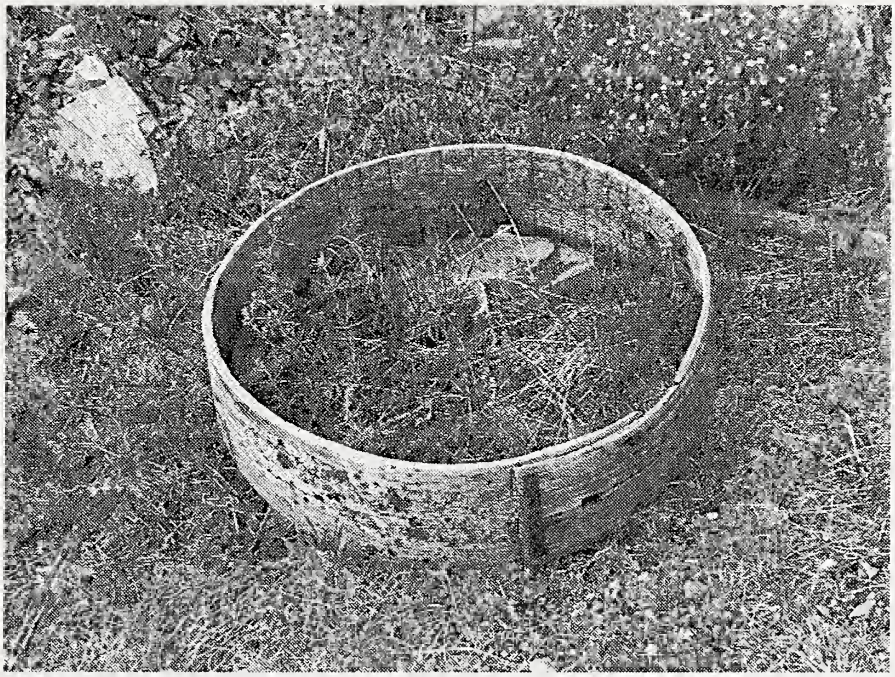
Soyö rock art site

Soyö rock art site

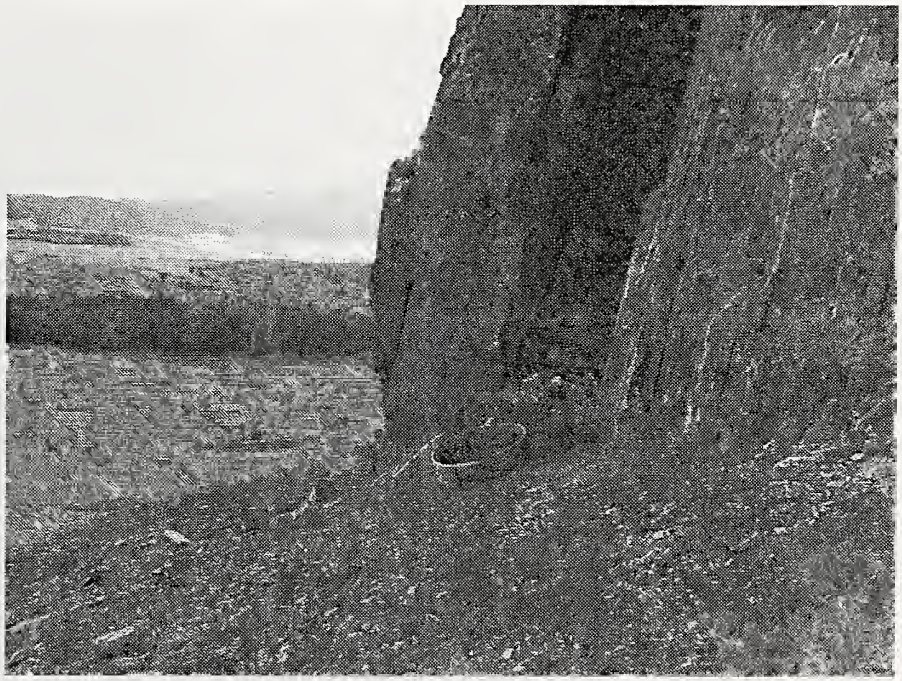
Darkhat Valley, Khugin-gol River - near rock art site

Darkhat Valley - new bridge built by the Japanese this year

Lichen patterns at shaman's cache site

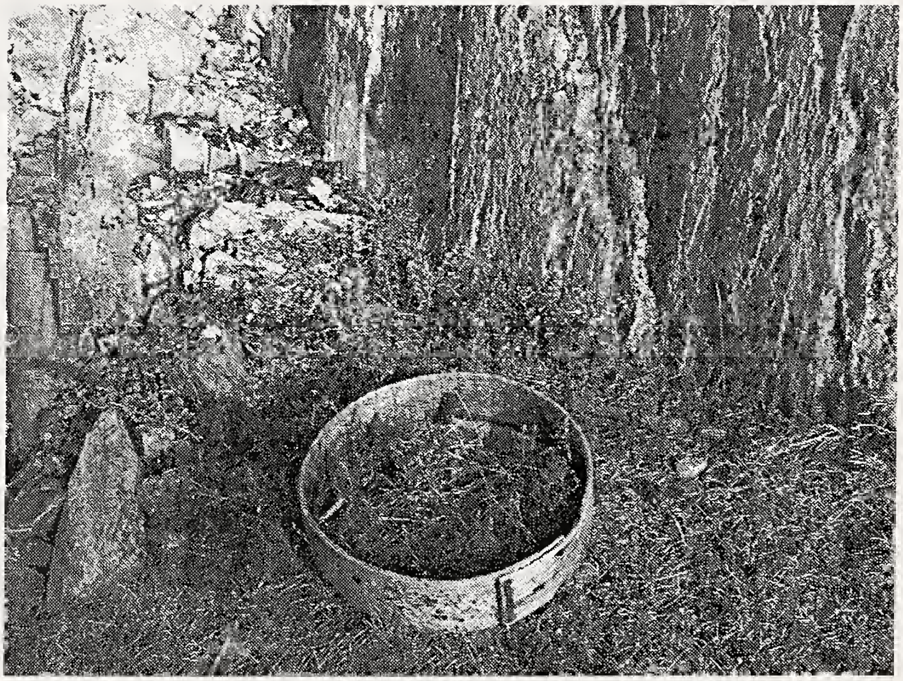


Shaman's drum at cache site

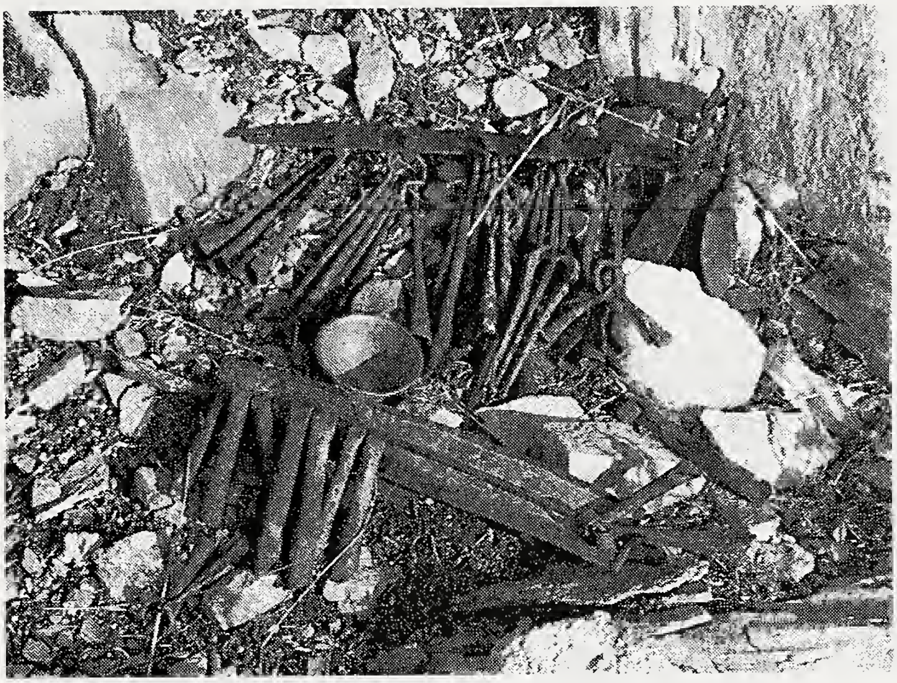


Shaman's cache site

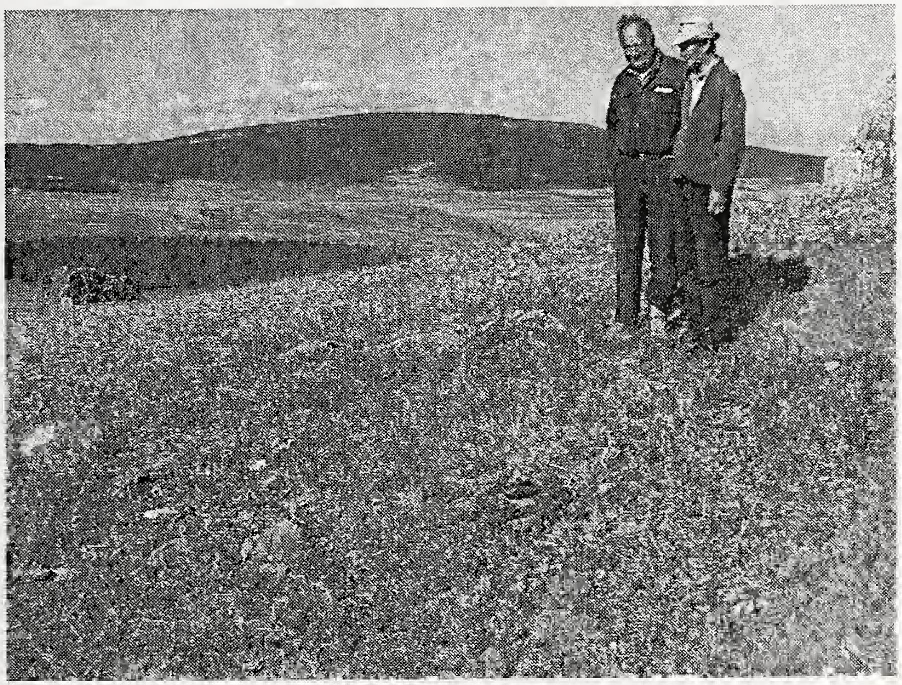
Shaman's cache site area



Shaman's cache site, drum hoop and metal accoutrements, left rear

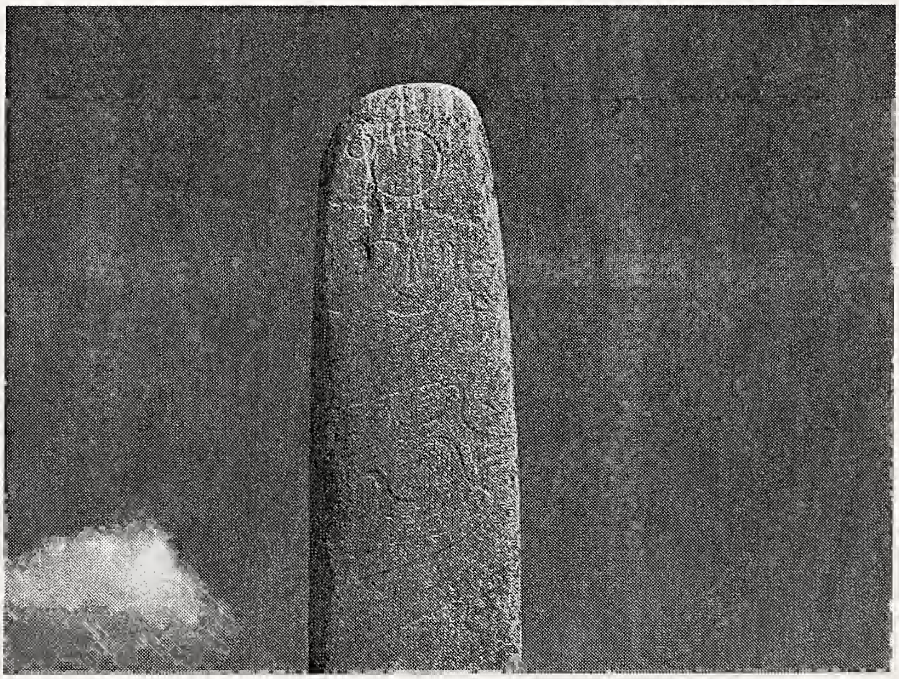


Shaman's rattles and paraphenalia



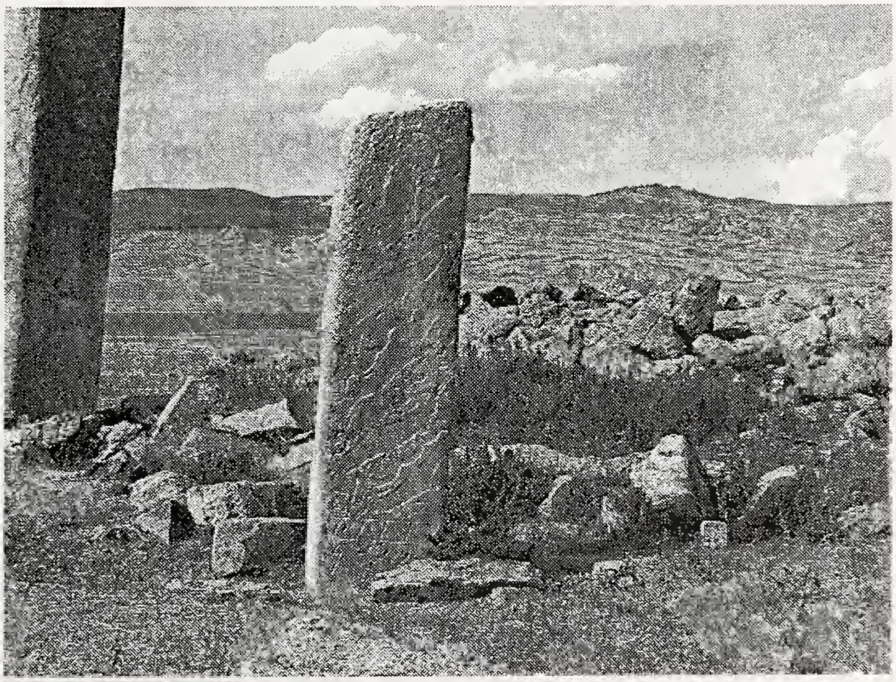
S. Young and Sanjmiatov at Iron Age burial site near shaman's cache site

Erkhel Lake site mound

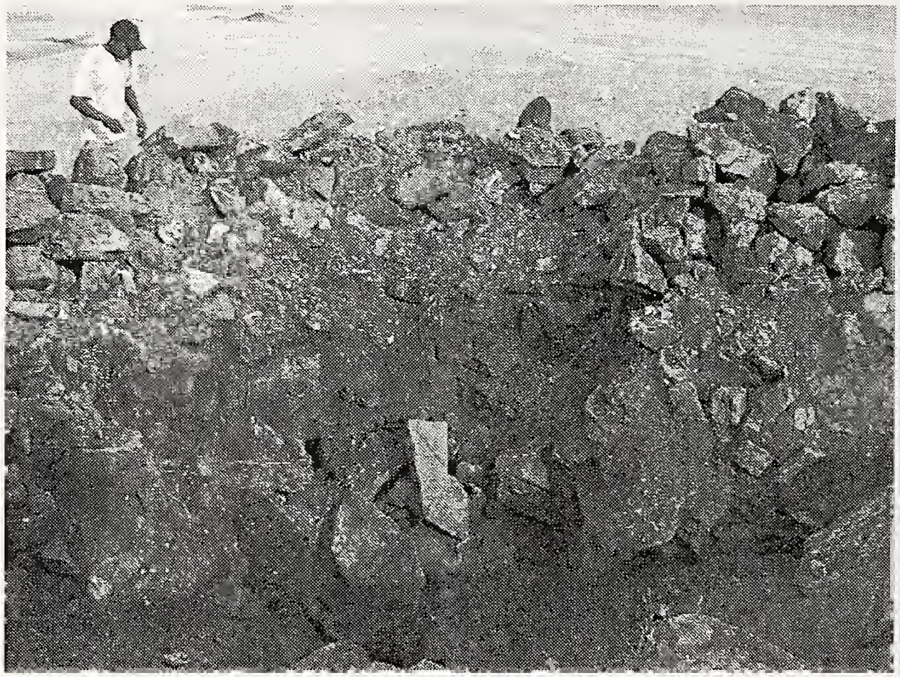


Large deer stone at Erkhel Lake

Test trench at Erkhel Lake site Deer Stone 5, North Wall, with rodent burrow disturbance

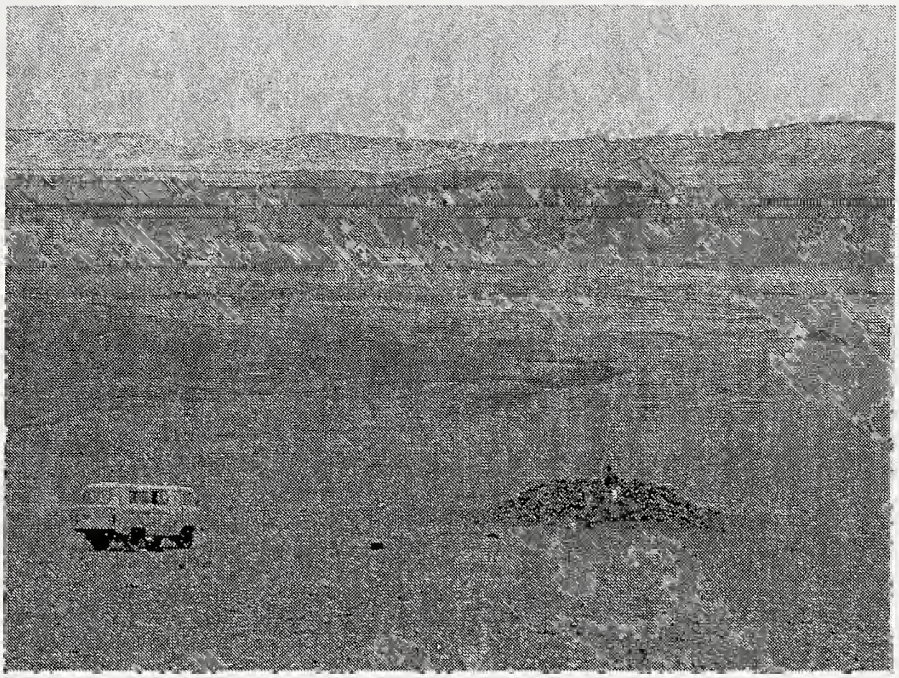


Deerstone 1 at Erkhel Lake site

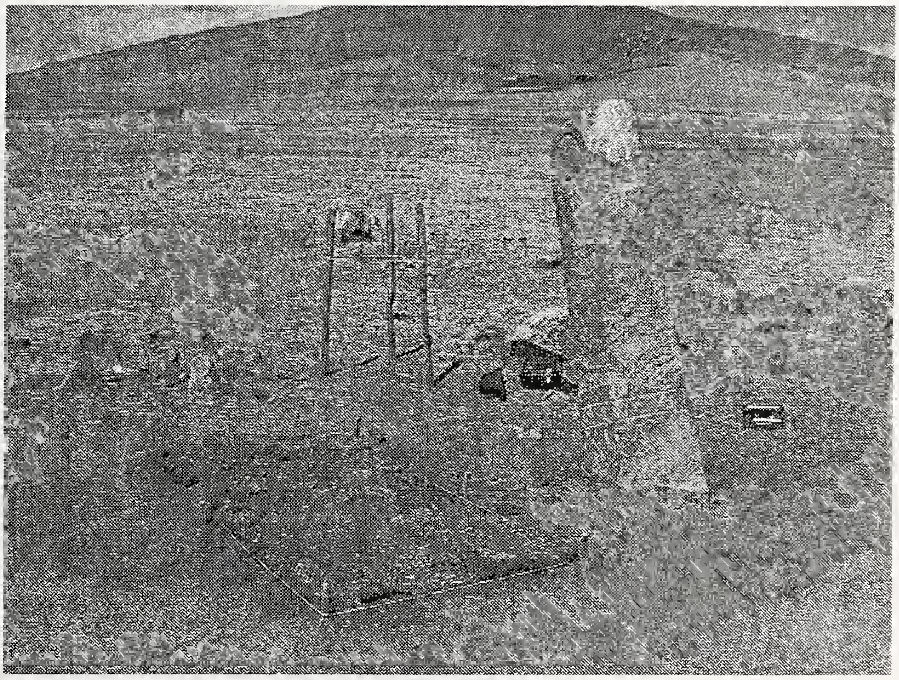


Looted burial mound at Erkhel Lake site, skull at pit bottom

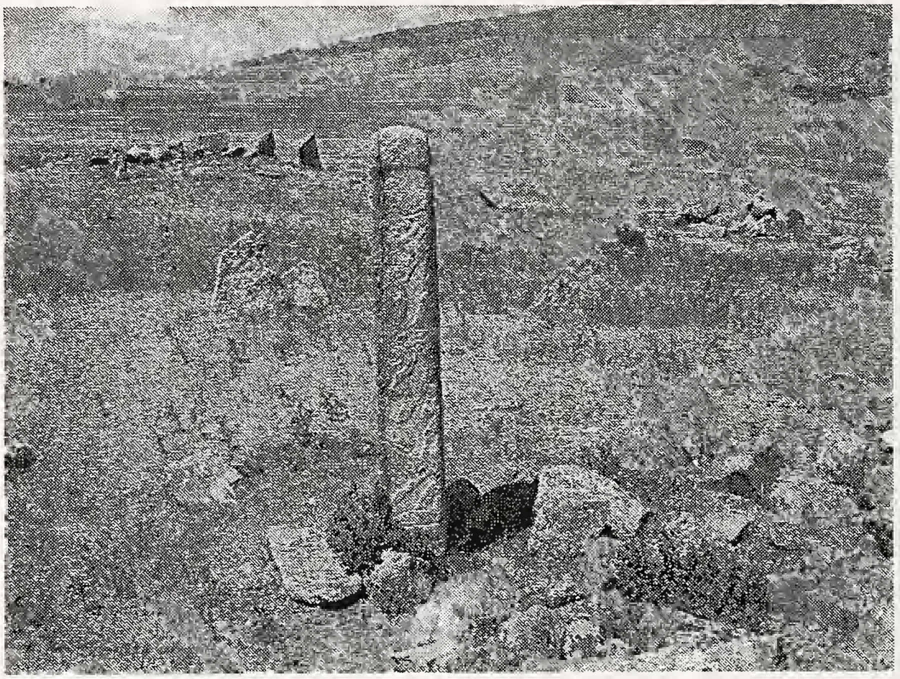
Looted mound at Erkhel Lake site, view east



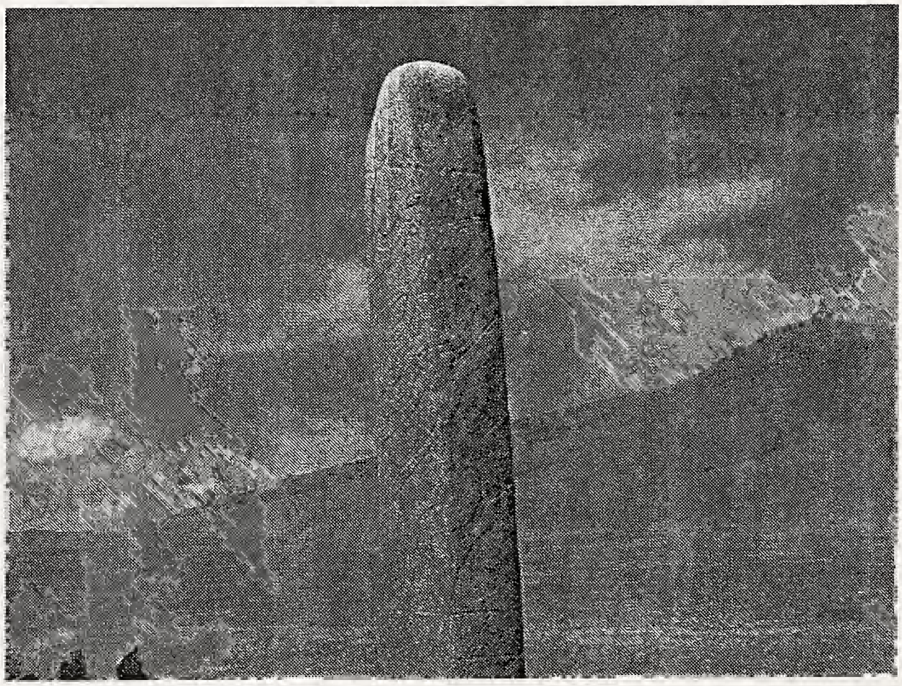
Erkhel Lake site mounds (looted mound in foreground)



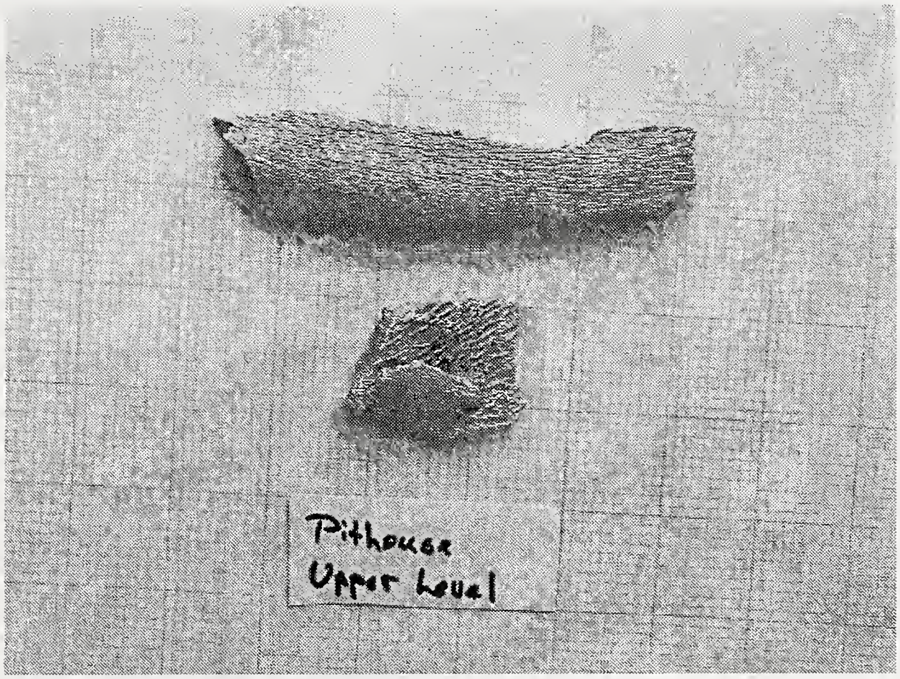
Erkhel Lake Deer Stone 5, refilled trench, view NW



Erkhel Lake Deer Stone 1

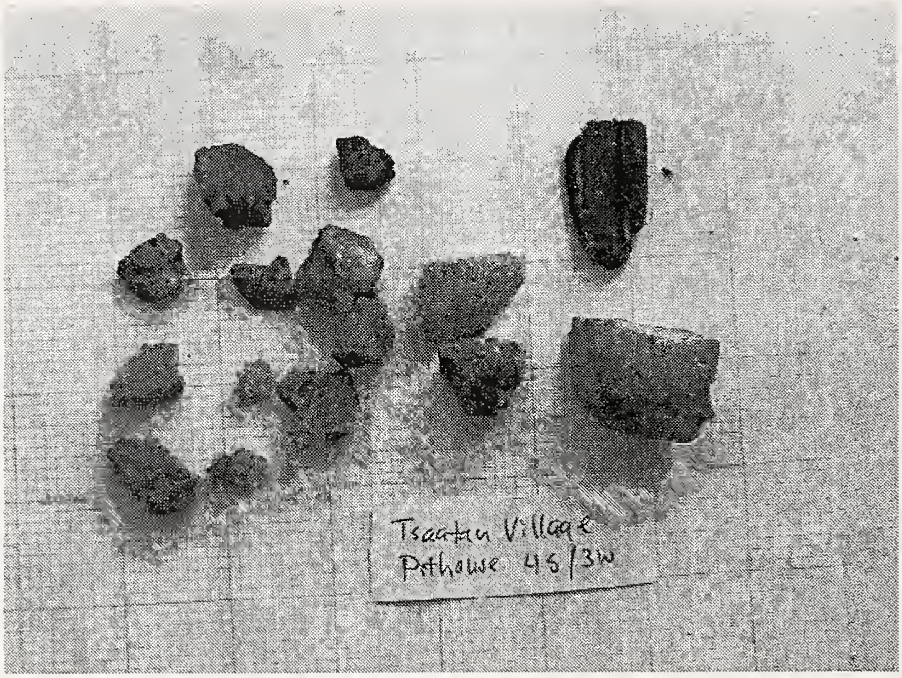


Erkhel Lake Deer Stone 2

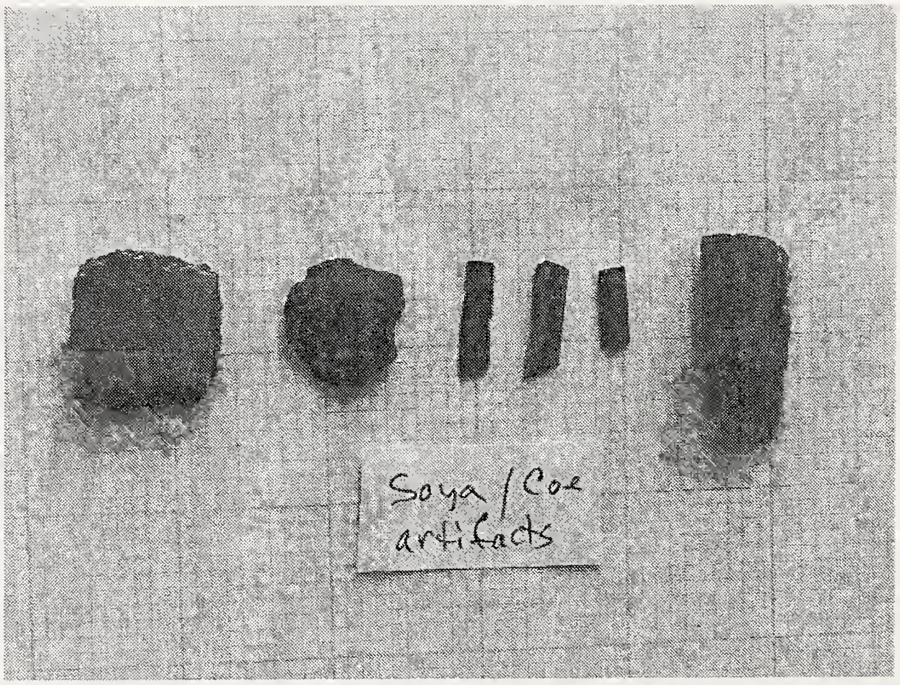


Mingit Polog Pithouse site collection

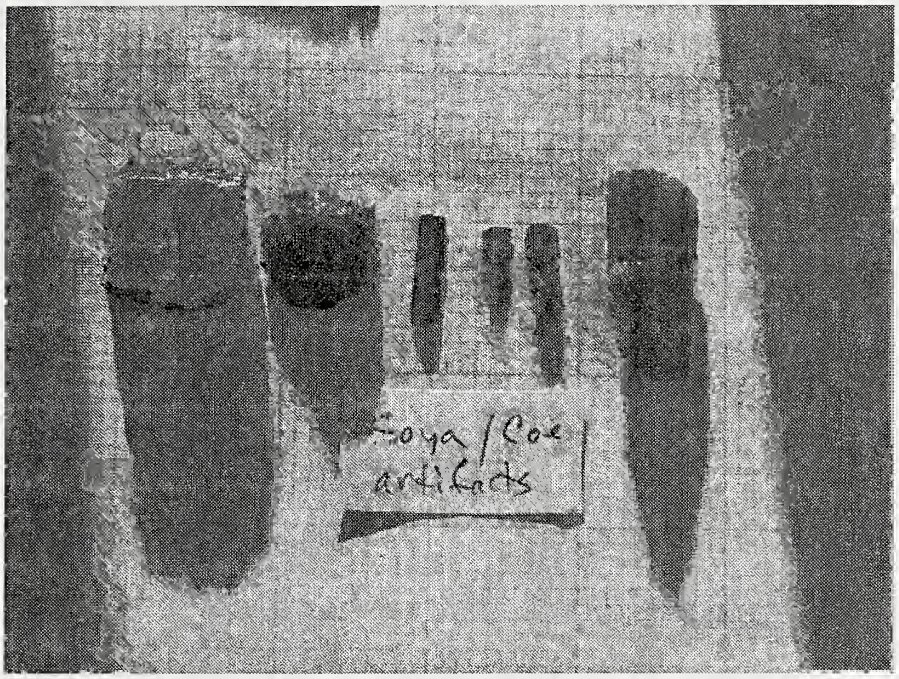
Mingit Polog Pithouse site collection



Mingit Polog Pithouse site collection



Soyö Neolithic site artifacts



Soyö Neolithic site artifacts

Erkhel Lake marmot hole surface find

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